Donations and Differentiation: Three Essays on Non-Profit Strategy

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Dennis A. Yao (Chair)

Signature Jordan I. Siegel .....
Jordan I. Siegel

Signature .....
Hong Luo

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WYSS | SOLDIERS FIELD | BOSTON, MA 02163 | Ph 617.495.6101 | Fx 617.496.2203 | doctoralprograms@hbs.edu | GEORGE F. BAKER FOUNDATION

Donations and Differentiation: Three Essays on Non-profit Strategy

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Sarah Wolfolds

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Donations and Differentiation: Three Essays on Non-profit Strategy

ABSTRACT

Given increased competition with for-profit firms, the issue of the comparative advantage of non-profit organizations is renewed. While non-profits may want to differentiate themselves when faced with additional non-profit competition, it is unclear whether they would want to differentiate themselves or converge towards for-profit competitors. This paper addresses this issue by considering the different financing models, human resource systems, and objectives of non-profit organizations, as compared to for-profits, in the mixed industry of microfinance.

In my first essay, I utilize an analytical model, where firms can choose profit status, sources of financing, and the borrowers they target with a given interest rate and loan size. I find that non-profit and for-profit organizations will segment the market, partly due to differences in profit status and partly due to differences in the sources of financing. I find support for the hypotheses using a large-scale panel dataset of microfinance organizations in Latin America.

The second essay focuses on a particular element of the business model considered in the first essay: deposit-taking. I show that non-profits that begin taking deposits only benefit financially if they also begin making larger loans. This suggests that changes in non-profits' activities may require a change

in positioning to improve financial performance. More broadly, it supports the literature on the importance of fit between product market strategy and business model, which suggests extra managerial attention be paid to whether and how to adopt activities that change the business model.

The third essay considers another key distinguishing element between the non-profit and for-profit business model: the incentive and reward systems for employees. I merge the panel dataset with a cross-sectional survey on the dimensions along which the firms incentivize employees, and develop a proxy for the level of bonus pay. The results suggest that more mission-oriented firms reward employees on more dimensions, but with lower average salary and a smaller amount of bonus pay. This suggests that incentive pay may be used as a signal in more mission-oriented firms to clarify the expectations of employee behavior, whereas it is used to directly motivate and incentivize employees in less mission-oriented firms.

The three essays of my dissertation combine to examine the characteristics that distinguish non-profit organizations, even in industries in which they co-exist with for-profits. The results shed light on these increasingly common mixed industries, as well as provide insight into business model competition and the fit between elements that make up a business model.

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Chapter 1

Competition between Endogenous Business Model Forms: Profit Status in the Mixed Microfinance Industry

ABSTRACT

The competitive dynamics between organizations that have distinct business models as a consequence of their different objectives has only recently become an area for theoretical and empirical analysis. Using the setting of microfinance where non-profits and for-profits directly compete in the same industry, this paper develops a formal analytical model investigating the objectives that organizations pursue in order to understand the resulting differences in business models. I test the predictions of the model with a firm-level panel dataset, covering 2003 through 2012 in Latin America. I find support for the model's predictions of differentiation in the wealth of borrowers served by the firm's profit status, as well as differentiation by its sources of financing. In addition, allowing for the endogenous choice of sources of financing leads to the hypothesis that non-profits may focus on even lower income borrowers when they face more for-profit competitors; this hypothesis is supported by correlational analysis in the data. Further, generalizing the theory to allow more socially oriented firms to choose their profit status may help to resolve the conflicting results in the literature regarding how non-profits behave with increasing commercialization.

Keywords: *non-profit strategy; competition; microfinance*

1 Introduction

Of central concern to the field of strategic management is how organizations obtain a competitive advantage (Barney, 1991). One subset of this literature looks at the types of strategic choices for a firm that together form a business model, and how and when different business models support competitive advantage in the market (Johnson *et al.,* 2008) and thus lead to superior performance (Zott & Amit, 2007). The business model is a concept which has been discussed since the 1950's (Osterwalder *et al.,* 2005), but in the last fifteen years has become widely used in the academic literature, as well as in the business press.

Despite the long history and increasing popularity of this concept, there is a call in the strategy literature for more empirical research of its usefulness and application (Wirtz *et al.,* 2015). However, this research area is often plagued by issues of measurement and unobserved heterogeneity as business models are difficult to define, both theoretically and empirically (Osterwalder *et al.,* 2005). In this paper, I use profit status as an organizational choice that determines the business models available to an organization by limiting its sources of financing. The decision to incorporate as a for-profit firm or not has important implications for the strategy that the firm should follow, and is reflected in differences in organizational and product market characteristics.

The context in which I consider the issue of business models and profit status is a mixed industry, microfinance, where for-profits and non-profits overlap. For-profits and non-profits overlap in an increasing number of industries (Ben Ner, 2002; Dees & Anderson, 2003), and the study of these mixed industries can illuminate understanding of business model competition (Casadesus-Masanell & Ricart, 2007).

Microfinance institutions vary in their approach according to their legal structure: for-profit institutions consist of commercial banks and non-bank financial institutions and non-profits consist of NGOs and credit unions.[1] On one end of the spectrum, the microfinance operations of for-profit

[1] There are a few cases where these definitions do not hold exactly, but 95% of banks are for-profits, 83% of NBFIs are for-profits, all NGOs are non-profits, and over 99% of credit unions are non-profits in my data.

commercial banks are large and have stream-lined processes such that their microfinance lending resembles their traditional, commercial banking. However, their focus on wealthy and corporate clients, due to their overall profitability goals, means that, for them, it can be difficult to target poor clients and less appealing to open branches in rural areas (CGAP, 2005). On the other end are non-profit NGOs that are more likely to be located in rural areas, use group lending,[2] and have less formalized processes. Thus, in one direction, segmentation of the borrowers targeted determines the lending strategy, and in the other direction, firms target borrowers that they are relatively more equipped to lend to.

Profit status has important implications, the most relevant here being the source and nature of external financing. In my analytical model, I assume that non-profits and for-profits get financed through different sources. For-profits can be financed through a mix of debt and equity, whereas non-profits can be financed through debt and donations. Despite the fact that "even for-profit organizations are allowed to take donations," it is likely that traditional donors "are familiar with lending to non-profits, so if they give $\$100,000$, they expect it to be $\$100,000$ of program services, not taxes" (Source 1). Similarly, if the for-profit organization has shareholders, "it's hard to convince [foundations and donors to donate] when they will feel like they are lining shareholders pockets" (Source 3). In addition, due to the legal definition of non-profits as satisfying the non-distribution constraint, which states that the non-profit is "barred from distributing its net earnings, if any, to individuals who exercise control over it, such as members, officers, directors, or trustees," non-profits cannot have shareholder equity (Hansmann, 1980). Thus, reflecting these differences in sources of financing, I assume the for-profits cannot access donations, whereas non-profits cannot use shareholder equity but do have access to donations.

While donors may have particular concerns about the use of funds as indicated by their unwillingness to give money to for-profits, equity holders have their own objectives, particularly in the expectation of financial returns. The key distinction between donors and investors is that

[2] Group lending is a lending approach where a certain amount of money is dispersed to a group, rather than to an individual. The idea is that the group has better knowledge about which people are reliable and likely to generate higher return, and peer pressure can be used to induce repayment. Group lending is quite frequently used in microfinance in Bangladesh and India, but is less common in Latin America.

investors "need to be repaid".[3] Thus even though the investors may be social impact investors, and not traditional investors, in that they do "look at us from a mission perspective", they are still investors, "so they have a fiduciary responsibility, meaning they don't want to take on an unwarranted amount of risk" (Source 1). In order to meet this financial responsibility objective, my interviewee suggests that "there is an incentive to obtain larger funds quicker... [and] to obtain larger loan size[s]" (Source 1). This is consistent with the result shown in my model that larger loans are associated with higher profitability. Thus, while the assumption that donors do not care about return whereas investors do is a simplification of reality, it sheds light on the effect that the differing incentives of different sources of financing may have on firm behavior. To the extent that the empirical analysis supports these differences, it suggests that, despite the simplification, I still capture an important mechanism at work.

My analytical model shows that non-profit and for-profit organizations will segment the market, partly due to differences in profit status and partly due to differences in the sources of financing. Because the profit-maximizing objective is inappropriate for a non-profit organization, I consider the alternative possible firm objective of maximizing the number of borrowers the firm reaches. For this client-maximizing type of firm, there is a choice between non-profit and for-profit status. Even among firms with the same objective function, the choice of profit status leads to differences in financing, not only in the possibility of accepting donations but also in the likelihood of accepting deposits. These choices in financing lead to endogenous differences in the borrowers served.

Using a self-reported, large-scale survey of microfinance organizations, I find support for the conclusions of my model regarding segmentation by profit status. In addition, segmentation occurs according to whether or not the firm accepts deposits. This suggests that the sources of financing used and the firm's profit status interact in an important way to form a business model that is better equipped to serve certain borrower wealth levels. Finally, segmentation is higher when non-profits compete more with for-profit organizations, suggesting that competition between business models importantly affects firm behavior and on average leads to differentiation rather than imitation.

[3] There are clearly other differences between donors and investors. In the analytical model, I assume donors would like lower income borrowers to be targeted, although donors may have additional and alternative objectives.

My assumptions and decisions on which variables to focus on come from four semi-structured interviews, as well as additional institutional knowledge provided by the academic literature and mainstream media. My interviews were with two microfinance CEOs (Sources 3 and 4), one manager at a microfinance network (Source 2), and one manager at an impact investment fund (Source 1), all based in Latin America. These provided me with a range of stakeholder perspectives to guide my model building. The key elements in this model are the existence of firms with different objective functions that have choices available to them, including their profit status and sources of financing.[4] These choices, along with the firm's objective, determine the type of borrower the firm lends to and how the firm will respond to competition.

The rest of this section will review the major literatures that I draw from. Section 2 presents the formal model to provide the basis and intuition leading to the testable hypotheses. Section 3 describes the data and presents the empirical analyses and Section 4 concludes.

1.1 Business Model Literature

This paper examines the distinct business models followed by non-profit and for-profit firms, and considers the mechanisms by which and the circumstances in which these business models support competitive advantage. While there is no widely accepted definition of what a business model is (Zott *et al.,* 2011), I use the definition from Casadesus-Masanell and Ricart (2010), which is inspired from Magretta (2002) and others: "the particular set of choices an organization makes about policies, assets and governance - and their associated consequences – are the organization's business model, because they determine the logic of the firm, the way it operates and how it creates value for its stakeholders" (Casadesus-Masanell & Ricart, 2010). Thus, the business model framework is an appropriate one with which to consider the effects of differences by profit status as it incorporates many of the aforementioned differences, including in sources of financing and borrower targeting.

Analyses of the interaction of different business models in the same industry is a recent endeavor,

[4] These choices in turn determine the cost of regulation to the firm.

with some theoretical work analyzing the effect on a focal firm of co-existing with another firm that employs a different business model (Casadesus-Masanell & Ricart, 2007; Casadesus-Masanell & Zhu, 2013). However, evaluation of the development of new business models or innovations in business models is an area where significant research has been undertaken, that area being called business model design (Zott & Amit, 2007; Zott *et al.,* 2011). The literature on business model innovation considers how business models may evolve to respond to changing technology (Chesbrough & Rosenbloom, 2002), how business model innovation can be used to improve corporate social responsibility efforts (Johnson & Suskewicz, 2009; Schaltegger *et al.,* 2012), and how business model innovation is linked to firm performance (Zott & Amit, 2007; 2008).

Most relevant to this paper is the burgeoning literature on the need and opportunity of using business model innovation to better serve borrowers at the "bottom of the pyramid", or borrowers with low levels of income and wealth (Alter, 2006; Dees, 1998; Yunus *et al.,* 2010; Glassl, 2012; Eyring *et al.,* 2011). The idea behind this literature is that business model innovation is necessary in order to serve very poor borrowers as the classic approach to business may not be applicable or feasible (Schaltegger *et al.,* 2012; Glassl, 2012). However, the literature on business models for firms serving social and financial goals, or social enterprises, is not well established, as even the definition of social enterprise cannot be agreed upon (Zahra *et al.,* 2009; Brouard & Larivet, 2011; Mair, 2011). Thus, this paper uses fundamental differences between business models, with variations in firm profit status, as an alternative approach for exploring the relationship between business models, particularly for low income and wealth customers.

1.2 Literature on Differences between Non-Profits and For-Profits

Non-profits are classically thought to have a comparative advantage in serving privately unprofitable customers, as their non-distribution constraint makes them trustworthy recipients of donations (Oster, 1995). On the other hand, this reliance on donations limits the potential scale that non-profits can obtain (Froelich, 1999). Further, the cost of obtaining this type of external funding differentiates non-profits from their for-profit peers (Kistruck *et al.,* 2013).

The extent of this comparative advantage is increasingly relevant with an increasingly diverse

set of firms operating in the for-profit sector, due to for-profit firms allocating more resources to corporate social responsibility efforts or even making these social initiatives part of their core organizational mission, as is the case in hybrid organizations. For example, some states have added a new legal structure, the B-corporation, which allows firms to have a corporate charter that explicitly focuses on both shareholder return and a social mission, and better accommodates this growing number of hybrid organizations (Battilana *et al.,* 2012). In addition, donations are becoming increasingly costly to obtain as competition on the donor side has increased (Scott, 2003). As a result of both of these factors, overlaps in markets between for-profits and non-profits are more frequent and substantial (Ben Ner, 2002). Understanding how markets with significant overlaps operate, including the role of donations and non-profit business models, is, therefore, of increasing importance.

While the non-distribution constraint is a key distinguishing factor between non-profits and for-profits that, in turn, influences the way these two types of organizations are financed, there is also substantial variation in behavior among non-profits (Brooks, 2005; Kistruck *et al.,* 2013). In particular, the extent to which a non-profit relies on donations also influences its response to for-profit competition, as a higher reliance on donations indicates its need to meet donors' requirements (Crittenden, 2000; Crittenden *et al.,* 1998). After non-profits received much negative attention in the media for high CEO salaries and low levels of organizational efficiency (Frumkin & Keating, 2001), a movement to quantify their efficiency, as well as donors' interest in their efficiency, intensified (Thornton, 2006; Bennett & Savani, 2003). In addition, due to their reliance on short-term and contingent donations (Oster, 1995; Kelly, 1991), non-profits have more difficulty in responding to external pressures, or to economic shocks, and thus additional external funding is needed in these circumstances (Galaskiewicz *et al.,* 2006; James, 1983). Thus, the prior literature on the non-profit sector has suggested that donations influence those firms' behavior; I extend this idea to differences both between and within for-profits and non-profits.

Further, within the non-profit literature, this paper provides a contribution by considering how financing choices, within the spectrum of characteristics of non-profits, may have lasting effects on their ability to respond to competitive pressures (Hodge & Piccolo, 2005; Verbruggen *et al.,* 2011). As new organizational forms continue to emerge and hybrid organizations with social objectives are

more common (Battilana & Lee, 2014), the question of whether there is still a place for traditional non-profits is increasingly relevant for non-profit managers and policy makers. However, business law does not divide the organizations based on their objective functions but by their profit status (Boyd *et al.,* 2009; Billis, 2010). Thus, in order to understand whether convergence between entities with different profit status is taking place, I first have to document the difference between the two business models as a function of their financing and objectives and then consider how this difference is changing with increasing commercialization of non-profits (Hermes *et al.,* 2011).

When there is a need for the services of charitable organizations (Drayton, 2005), but there is increased entry by for-profit competitors (Ryan, 1999; Kaul & Luo, 2015), the issue of the comparative advantage of non-profit organizations becomes of increasing importance. While non-profits may want to differentiate themselves when faced with additional non-profit competition (Barman, 2002), it is unclear whether they would want to differentiate themselves or converge towards the characteristics of their for-profit competition. This paper addresses this issue by considering how the different financing models and objectives of non-profit organizations, as well as for-profits, in a mixed industry, affect decisions regarding which borrowers to serve and the sources of financing to pursue.

1.3 Microfinance Literature

The origin of the modern microfinance industry is attributed to Professor Mohamed Yunus who started Grameen Bank in Bangladesh in 1975 (Bruck, 2006). By the early 1990s, microfinance was starting to be seen as not just a space for NGOs, as indicated by the fact that BancoSol-NGO and Los Andes-NGO had spun off their microfinance lending into regulated, commercial firms (Battilana & Dorado, 2010).

Recently, countries are facing increasing pressure to regulate the industry as there is concern that too much profit is being made from the very poor (Rosenberg, 2007; Ashta & Hudon, 2012). However, regulations in this industry are often poorly written and may be counter-productive and hinder development, as regulated microfinance institutions (MFIs) are more likely to serve a higher-income population and a smaller proportion of women (Cull *et al.,* 2011). Similarly, implementing

interest rate caps leads existing firms to focus on higher-income population (Campion *et al.,* 2010). Thus regulation, which differs according to the MFI's profit status, is an important characteristic that influences firm behavior in this industry.

Traditionally, the strategy of microfinance institutions was to make enterprise loans with no physical collateral (Nourse, 2001), instead using group lending to ensure repayment (Wenner, 1995). The common example of these early loans was that there are trucks with produce and goods that come in to the town on Wednesday and market vendors need to buy the goods to sell over the weekend. If the vendor can take out a loan to get more produce, then he can sell more and repay the loan in a week (Battilana & Dorado, 2010). Generally, the length of such loans is quite short, usually within months or up to a year and repayment rates are quite high (Morduch, 1999).[5]

The "best practices" literature in microfinance discusses firms' lending strategy, such as the optimal interest rate, group versus individual lending, optimal loan size, and commercialization of the organization (Brau & Woller, 2004). Firms vary in whether they target the marginally poor (near the poverty line) versus the very poor (Navajas *et al.,* 2000). More generally, the prior literature suggests that there exists important variance in the borrowers targeted and in organizational practices by MFIs. Such differences support the microfinance context as an appropriate place to consider the effects of different business models.

There has been substantial interest in the commercialization of the industry as a whole, and the extent to which this commercialization has changed the goals of microfinance institutions. On one hand, Hermes *et al.,* (2011) find, not surprisingly, that outreach and cost efficiency are negatively related.[6] This implies that firms that are more efficient have a narrower outreach, meaning they focus less on the underserved population. However, Mersland and Strom (2010) perform a

[5] Thus, in addition to loan size and interest rate, the firm also decides the length of the loan (or repayment time). This dimension is not explicitly factored into my model. However, shorter repayment times are associated with smaller loans and smaller loan sizes are used to reach very low income borrowers. This is consistent with the relationship between loan size and borrower wealth that I find in my model. As a result, incorporating different repayment times would only strengthen this relationship and not change the substance of the model.

[6] The authors use stochastic frontier analysis (SFA) to calculate the efficient cost frontier. Cost efficiency is then defined by how close the organization is to this frontier.

large-scale data analysis of 379 MFIs from 1998 to 2008 to examine the extent to which mission drift, measured by average loan size, may occur as a result of increasing pressure for firms to be self-sustainable; the authors do not find evidence of such mission drift, as in fact they find that the more cost effective the MFI is, the smaller the average loan.

Thus it is unclear from the existing literature whether pursuing efficiency and financial sustainability is at odds with reaching the more underserved population. My paper extends this existing work by focusing on the commercialization of the industry, and examining how the less commercially-oriented segment, according to differing objective functions, may or may not want to pursue for-profit status and wealthier borrowers depending on external conditions and relative cost differences. This approach can explain why different samples have led to conflicting empirical findings in the prior literature.

Popular debate burgeoned regarding whether microfinance firms should be allowed to achieve significant profits following the financial success of the initial public offering (IPO) of Compartamos, an MFI in Mexico (Ashta & Hudon, 2012), and evidence that MFIs were charging higher interest rates to the poor, at times even achieving a higher return than commercial banks (Rosenberg *et al.,* 2010). While this pursuit of profit associated with the for-profit status thus has potential issues, Bogan (2012) found that the use of grants, more often associated with non-profit MFIs, leads to lower financial performance.[7] Thus, it is suggested that non-profits may have less incentive to cut costs. Ly and Mason (2011) provide a similar explanation: competition by NGOs for these scarce donations wastes resource and delays implementation of efficiency enhancing programs for firms that rely on grants. Rather than focusing on purported non-profit inefficiency, my analytical model assumes that for-profit and non-profit organizations make financing and product market choices fully aware of these costs and optimize based on their different objectives.[8] As a result, differences in firm financial performance are a consequence of different firm objectives that lead to targeting

[7] Grants can be thought of as a type of donation as they are given without expectation of return and providers of grants are generally motivated by achieving some social objective.

[8] I also allow donations to be costly, and this parameter can be interpreted as the cost of effort to compete for donations.

of borrowers with varying levels of wealth, and thus varying levels of profitability.

2 Model

I build a model of the objective functions, profit status, and funding and lending choices of firms in the microfinance industry in order to develop intuition regarding the behavior of and competition between firms with different business models. The general idea is that firms can have one of two possible objectives: maximizing profit or maximizing the number of borrowers served. Then, firms have two possible choices in terms of profit status, and additional choices regarding their business model such as how to finance their operations and the wealth of the borrowers to serve.

2.1 Model Set-Up

Let there be N potential borrowers in the low-income market, denoted $n = 1, ..., N$.[9] Borrowers are heterogeneous in terms of their initial wealth. Let w_n be the measure of how wealthy the n^{th} borrower is, where $w_n \in [0, 1]$ is distributed according to a uniform distribution and higher values of w mean the borrower is wealthier.[10]

Loans can be made to borrowers; they may vary in interest rate, r_n, and size of the loan, V_n. Assuming successful repayment, borrowers get increasing utility from the size of the loan and decreasing utility from the interest rate. Let $p_n(w_n, V_n, r_n)$ be the probability that the loan is fully repaid, where this probability is increasing in w_n and decreasing in V_n and r_n, so wealthier borrowers are more likely to repay and smaller loans or those with lower interest rates are more likely to be repaid.[11] This repayment probability is similar to that used in McIntosh and Wydick (2005),

[9] See Table 1.1 for a list of all of the symbols used in the model, as well as their definition and operationalization.

[10] This is analogous to the initial level of productive assets, k_i, that McIntosh and Wydick (2005) describe. Wealthier borrowers have $w_n > 1$ and are served by commercial banks. Thus, $w_n \in [0, 1]$ can be thought of as the segment of low-income population unserved by the traditional banking industry.

[11] This is similar to the use of a probability of high or low return in McIntosh & Wydick (2005). I make the assumption here that repayment is the key dimension as opposed to the success of the project being funded, as part of the reason that wealthier borrowers may be more desirable borrowers is that they could use existing wealth to repay the loan. In other words, these loans are often not project-specific and so the outside wealth and general repayment ability is actually what is relevant for the microfinance institution.

although I assume that the risk of default depends on the total amount to be paid back, the loan size multiplied by one plus the interest rate, rather than just on the loan size.

Let β_R be the rate of return that a borrower makes if he is able to repay the loan, and β_B be the rate of return that the borrower makes if he is not able to repay the loan fully, or the borrower goes "bankrupt".[12] I assume that the borrower does not get to keep any of the loaned amount or of the project return if he is not able to fully repay the loan. Then the borrower's expected surplus is:

$$S_n(r_n, V_n) = p_n(\beta_R - (1 + r_n))V_n \tag{1}$$

This equation says that, if the loan is fully repaid with probability p_n, then the borrower will earn a return on the investment minus whatever he has to pay back in terms of interest, multiplied by the size of the loan.

Turning to the MFI firms, let there be J total firms, denoted $j = 1, ..., J$. Firms will have distinct objective functions. First, profit-maximizing firms will maximize the profit generated by the firm. Second, client-maximizing firms will maximize the number of borrowers served by the organization.[13] Besides differences in their objective functions, firms vary in their organizational status as either for-profit or non-profit. Their organizational status will, in turn, affect the financing of the organization, where non-profits will have access to a limited amount of donation money whereas for-profits will not have any such access. On the other hand, for-profits will have access to equity, giving them a cheaper source of funding relative to debt. In addition, firms can choose to supplement their external financing by accepting deposits. Both the selection of for-profit status and the decision to accept deposits will increase the regulatory costs faced by the firm.

[12] As mentioned above, these can be thought of as returns in the good and bad states of the world, for instance. I assume that they are both fixed and exogenous. Another realistic assumption would be to allow them to increase with the wealth of the borrower, suggesting that wealthier borrowers have access to better financial opportunities. This would increase the differences between borrower types, but allowing wealthier borrowers to repay with higher probability, as I do in my model, leads to similar model results.

[13] These are the same classifications used by McIntosh and Wydick (2005). Using the same classification allows me to focus on the effects on results of my different assumptions.

The firms will all have the same general form of the profit expression from providing a loan to a given borrower n, conditional on the organizational type, including the profit status, denoted $t \in \{0, 1\}$, where one indicates a for-profit and zero a non-profit, and whether or not the firm accepts deposits, $d \in \{0, 1\}$:

$$\pi_n^{d,t}(r_n, V_n) = p_n(1 + r_n)V_n + (1 - p_n)\beta_B V_n - (1 + c)V_n - F(d, t) \tag{2}$$

where r_n and V_n are the interest rate and the size of the loan, respectively, made to borrower n, and c is the marginal cost of capital. $F(d, t)$ is the per-borrower administrative cost for a firm of profit type t and deposit type d.[14] Thus, if the loan is fully repaid, the firm receives the value of the loan back plus the interest paid on that loan, whereas if the loan is delinquent, the firm gets simply whatever lower return has been earned until default. Regardless of whether the loan is fully repaid or delinquent, the firm will incur the cost of capital and the fixed, administrative cost from making the loan. The per-borrower administrative cost is assumed to also encompass the cost of complying with regulation, and thus I model it as:

$$F(d, t) = f_0 + f_1 d + f_2 t + f_3(d * t) \tag{3}$$

where f_1 reflects the higher regulatory cost for a firm if it accepts deposits (or $d = 1$), f_2 reflects the higher regulatory cost for a for-profit firm (or when $t = 1$), and f_3 is the interaction of those two indicators. I assume $f_1 > 0$, $f_2 > 0$, and $f_3 < 0$. In other words, I assume for-profits face higher regulatory scrutiny in general. In addition, deposit-taking is associated with higher regulatory costs, but the additional regulatory costs from deposit-taking are lower for a for-profit firm than for a non-profit institution.

The marginal cost of raising the funds will depend on the source of the funding, from some

[14] Notice that a marginal cost rate is incurred based on the loan amount for each loan that is made and that a fixed, administrative cost is incurred for each loan. The administrative cost is distinct from a fixed cost of entering the market, which would be incurred at the firm level as opposed to the individual borrower level. These administrative costs capture loan-level costs, such as paperwork for making a loan and travel costs to reach the borrower and collect repayments. The important part of this cost structure is that for-profits face higher fixed costs that encourage larger loans. This type of effect would likely persist even if the fixed cost were incurred only at the firm-level, although the magnitude of the loan size effect would be weaker.

combination of donations (or giving) (G), debt (B), equity (E), and deposits (D), where G, B, E and D represent the respective share (not amount) of total funding from each of these sources. This marginal cost is meant to capture both the interest (or return) paid on the type of funding and the costs of acquiring these funds. In particular, I do not require the marginal cost of donations to be zero, as acquiring donations is thought to be particularly, and increasingly, costly.[15] For for-profits, donations will not be available whereas for non-profits, equity will not be available. The marginal cost of capital can be broken down into its components:

$$c = c_1 G(\mu_j) + c_2 B + c_3 E + c_4 D(\mu_j) \tag{4}$$

where μ_j is the average wealth of borrowers served by firm j, or $\mu_j = \frac{\sum_{n=1}^{N_j} w_n}{N_j^*}$, where $n \in [1, N_j]$ represents the set of borrowers being served by firm j, and N_j^* is the number of borrowers in that set.[16] The share from donations, G, is assumed to decrease in the average wealth of borrowers served whereas the share from deposits, D, is assumed to increase in the average wealth of borrowers served. The cost expression is thus a weighted average, where each c_i reflects the marginal cost of that source of funding and is multiplied by the share of funding that comes from that source.

Using this profit expression, I then specify each organization's maximization problem. Given that non-profits cannot distribute any earned profit to owners, I assume that all profit-maximizing firms are for-profits, but that client-maximizing firms may choose between for-profit and non-profit status. Firms will choose the loan specifications, (V_n, r_n), to offer to each borrower n at wealth level w_n to maximize their objective. In other words, this approach assumes that there is perfect price discrimination for each wealth level (or, as is equivalent in this set-up, for each borrower) as the firm can make each borrower a distinct, take-it-or-leave-it loan offer based on his wealth.[17]

[15] This more general specification allows for future analysis where I could allow the cost of obtaining donations to vary over time (or across firms for reasons other than the borrowers' wealth), which reflects the realistic scenario of the recently increasing costs to obtain donations.

[16] Note that in calculating this mean, if the firm is a monopoly serving borrowers from $w_{d,t}$ to 1, then the mean will simply be: $\frac{1+w_{d,t}}{2}$. However, if the firm is a duopoly and splits the market for some wealth segments, then the mean value for each firm will be calculated using both the wealth levels served and the proportion of borrowers served by each firm at each wealth level.

[17] While this is a simplification, the focus of the model is which borrowers to target and sources of financing to pursue. In reality, non-profits are thought to pay more attention to overcoming information asymmetry given that

A profit-maximizing for-profit firm, denoted j, will thus choose (V_n, r_n) to solve:

$$max \sum_{n=1}^{N_j} \pi_n^{d,t=1}(V_n, r_n) \text{ subject to} \tag{5}$$

$$S(r_n^j, V_n^j) \geq S(r_n^{-j}, V_n^{-j}) \; \forall n \in N_j, -j \neq j \text{ (Borrower Incentive Compatibility Constraint)} \tag{6}$$

$$S(r_n^j, V_n^j) \geq 0 \; \forall n \in N_j \text{ (Borrower Individual Rationality Constraint)} \tag{7}$$

$$D(\mu_j) + B + E = 1 \text{ (For-Profit MFI Budget Constraint)} \tag{8}$$

$$\sum_{n=1}^{N_j} \pi_n^{d,t=1}(V_n, r_n) \geq 0 \text{ (For-Profit MFI Existence Constraint)} \tag{9}$$

Thus, the profit-maximizing firm maximizes profit subject to the borrower surplus from this loan offer being (weakly) greater than the borrower surplus from accepting any other firm's offer with these loan characteristics (r_n^{-j}, V_n^{-j}), (equation 6), as well as generating an expected surplus for the borrower (equation 7). The firm's maximization is also subject to the firm being fully funded through shares of deposits, debt, and equity (equation 8). Since I assume that profit-maximizing firms must be for-profits, such firms will not have access to donations but will have access to equity. Thus, the budget constraint ensures that the firm obtains sufficient funding. In addition, it has to earn a positive net profit for it to decide to continue operating in the market (equation 9). Notice that the firm chooses the size of the loan and interest rates to charge to each borrower n to maximize the sum of per-borrower profits for the firm of type $d, t = 1$.

The client-maximizing firm will choose the size of the loan and an interest rate to maximize the total number of borrowers who actually accept a loan offer by the firm, or N_j^*. Thus, a client-maximizing for-profit firm will choose (V_n, r_n) to solve:

$$max \; N_j^* \text{ subject to} \tag{10}$$

they rely on personal relationships with borrowers to determine loan size or a similar mechanism with group loans. To the extent that this allows them to reach even lower income borrowers, where traditional methods of verifying ability to repay a loan like credit bureaus are less available, this will encourage even more segmentation of loan size between for-profits and non-profits and thus is consistent with the findings of my model.

$$S(r_n^j, V_n^j) \geq S(r_n^{-j}, V_n^{-j}) \ \forall n \in N_j, -j \neq j \text{ (Borrower Incentive Compatibility Constraint)} \quad (11)$$

$$S(r_n^j, V_n^j) \geq 0 \ \forall n \in N_j \text{ (Borrower Individual Rationality Constraint)} \quad (12)$$

$$D(\mu_j) + B + E = 1 \text{ (For-Profit MFI Budget Constraint)} \quad (13)$$

$$\sum_{n=1}^{N_j} \pi_n^{d,t=1}(V_n, r_n) \geq 0 \text{ (For-Profit MFI Existence Constraint)} \quad (14)$$

Thus, I see that the constraints mirror those of a for-profit profit-maximizing firm, but the objective function reflects the goal of the client-maximizing firm to reach as many borrowers as possible. In particular, equations 11 and 12 match equations 6 and 7 because these are borrower constraints. Equations 13 and 14 match equations 8 and 9 as these are MFI financing constraints that are specific to the for-profit organization.

On the other hand, a client-maximizing non-profit firm will choose the same parameters to solve the same function as a client-maximizing for-profit firm, except for that the budget constraint will be as follows:

$$D(\mu_j) + G(\mu_j) + B = 1 \text{ (Non-Profit MFI Budget Constraint)} \quad (15)$$

and the firm existence constraint will incorporate donations, essentially allowing the firm to operate at a net loss:

$$\sum_{n=1}^{N_j} \pi_n^{d,t=0} + G(\mu_j) \sum_{n=1}^{N_j} V_n \geq 0 \text{ (Non-Profit MFI Existence Constraint)} \quad (16)$$

where $G(\mu_j) \sum_{n=1}^{N_j} V_n$ represents the total amount of donations brought in, as it is the share of funding from donations multiplied by the total amount of loans. The constraints mirror those of the for-profit firm, except for that the non-profit client-maximizing firm has donations in its budget constraint as opposed to equity, reflecting the financing differences that go along with the profit status choice. In addition, it can operate at a net loss equivalent to the amount of donations brought in. However, I assume that the non-profit client-maximizing firm still sets the loan size to maximize the per borrower profit. In other words, I do not allow the firm to set arbitrarily small

loan sizes to very low income borrowers in order to increase donations.[18]

While the objective function and relative costs of financing influence the choice of profit status and sources of funding, the sources of funding also influence firm behavior. In order to capture this, I endogenize deposits and donations to capture real-world constraints that these sources of financing impose. The assumption that equity is only available to for-profits whereas donations are only available to non-profits imposes a first-order constraint. However, these sources of financing also may require different administrative costs, as well as depend on the type of borrowers that the firm targets. I endogenize donations and deposits to capture these characteristics.

I assume that donors want to incentivize non-profit organizations to serve particularly low-income borrowers in order to encourage expansion of the lending market. For purposes of exposition, I will assume a simple form of the donation function. Recall that w_n is the wealth of the n^{th} borrower. Then, the donation function, G, should be generally decreasing in the average of w_n of the borrowers that a firm serves, or μ_j. Thus, I impose a functional form[19] given by:

$$G(\mu_j) = M - \gamma\mu_j \tag{17}$$

where $M > 0$ and $\gamma > 0$. This operationalization, while simple, captures both the capped nature of donations[20] and the fact that donations will encourage lending to low income borrowers.

Depositors value the stability of knowing that their deposits will be well-taken care of, and thus appreciate formalized, large institutions to guarantee access to and availability of their deposits at a date in the future.[21] Also, to the extent that existing borrowers may choose to begin depositing,

[18] Alternatively, this behavior could be avoided if I instead endogenized the giving function with a weighted average borrower, where the wealth of the borrowers targeted is weighted by the size of the loan made to that borrower.

[19] I choose this continuous approach rather than a threshold value to discourage knife-edge behavior.

[20] Because this donation function is for the share rather than the level of donation, it means that the total share of the financing from donations for a given organization is capped, which reflects realistic donor behavior to ensure the organization is maintaining some self-sufficiency by funding some of its own loans. However, similar results occur if instead the level of donations is capped.

[21] This is particularly true in the microfinance context as these institutions generally do not have deposit insurance.

deposits will be higher for organizations with larger loan sizes, as these wealthier borrowers will have more money to deposit.[22] Thus, I assume that deposits will be higher for organizations targeting wealthier borrowers.[23] I operationalize this endogenous deposit function in a linear and separable function for simplicity:

$$D(\mu_j) = \delta_1 + \delta_2 \mu_j \tag{18}$$

where $\delta_1 > 0$ and $\delta_2 > 0$. In other words, this function captures that the share of funding from deposits increases with the average loan size.

Using this basic set-up, I analyze how profit-maximizing and client-maximizing firms choose profit status and financing, as well as the borrower segment they target, based on the cost structure and competitive landscape of the economy.

2.2 Monopoly Analysis

While my hypotheses are based on a competitive setting, I first explicitly solve the monopoly case to serve as a benchmark and to generate intuition regarding the decision processes of organizations in this industry. I examine the scenarios and maximization problems analytically, and provide numerical examples under certain parametric conditions to illustrate the analysis.

I solve the maximization problem for each possible objective function-profit status combination to find the borrowers targeted and sources of financing utilized. First, I examine profit-maximizing firms, and use the following to analyze their behavior:

Lemma 1: Profit-maximizing firms will make larger average loan sizes to wealthier borrowers.

Proof. Proof of Lemma 1:

[22] Even if it is not the same set of borrowers who become depositors, this relationship is plausible if the microfinance organization is located in a wealthier area and thus has easier access to wealthier depositors, who make larger deposits.

[23] There is also the possibility that depositors value organizations under higher regulatory scrutiny, with the idea being that their deposits are more secure. This would increase differences between for-profit and non-profit financing choices and thus my choice to exclude this dimension is a conservative modeling choice, as I solely rely on average borrower wealth to endogenize differences in the amount of deposits between for-profits and non-profits as opposed to parameterizing the difference.

The approach of the proof is to find the optimal loan size for a profit-maximizing firm, and show that it is increasing in w_n. Because the firm is profit-maximizing, it would not want to leave any excess surplus for the borrower, so the individual rationality constraint will hold with equality under the assumption of perfect information and price-taking consumers (and thus perfect price discrimination), or: $S(r_n^j, V_n^j) = 0$. Plugging in for S, I see that this is equivalent to: $p_n(\beta_R - (1 + r_n))V_n = 0$, and thus the firm will set $\beta_R = 1 + r_n$. I can plug this into the profit expression to get:

$$\pi_n^{d,t=1} = p_n \beta_R V_n + (1 - p_n)\beta_B V_n - (1 + c_{d,t=1})V_n - F(d, t = 1) \tag{19}$$

I assume a linear and separable function for the repayment probability given by: $p_n(w_n, V_n, r_n) = \rho - \rho_v V_n(1 + r_n) + \rho_w w_n$, where $\rho_v > 0$ and $\rho_w > 0$ and the values of ρ, ρ_v, and ρ_w are exogenously determined parameters, while p_n is endogenous to the wealth of the borrower and loan terms that the firm chooses. Plugging in the optimal interest rate, this repayment probability becomes: $p_n = \rho - \rho_v V_n \beta_R + \rho_w w_n$. Plugging this in to the profit expression, I get:

$$\pi_n^{d,t=1} = (\rho - \rho_v V_n \beta_R + \rho_w w_n)\beta_R V_n + (1 - (\rho - \rho_v V_n \beta_R + \rho_w w_n))\beta_B V_n \tag{20}$$

$$-(1 + c_{d,t=1})V_n - F(d, t = 1)$$

Taking a partial derivative with respect to V_n, and setting it equal to 0, I can solve for the optimal loan size:

$$V_n^* = \frac{c_{d,t=1} - \beta_B + (p + \rho_w w_n)(\beta_B - \beta_R) + 1}{2\rho_v \beta_R(\beta_B - \beta_R)} \tag{21}$$

Thus, I see that Lemma 1, stating that larger loans are made to wealthier borrowers, holds because:

$$\frac{\partial V_n^*}{\partial w_n} = \frac{\rho_w}{2\beta_R \rho_v} > 0 \tag{22}$$

□

Lemma 2: Profit is increasing in the wealth of the borrower served for profit-maximizing firms.

Proof. Proof of Lemma 2:

I take the derivative of the profit function using this optimized loan size to show that profit is also increasing in w_n (and thus also in V_n). First, recall the expression I have for the profit function is given by:

$$\pi_n^{d,t=1} = p_n \beta_R V_n + (1 - p_n)\beta_B V_n - (1 + c_{d,t=1})V_n - F(d, t = 1) \tag{23}$$

I have assumed a functional form for $p_n = \rho - \rho_v V_n^* \beta_R + \rho_w w_n$, and I can use the value of V_n that I solved for above, and plug these both in to the profit expression. First, I will plug the value of V_n into the expression for p_n and simplify:

$$p_n = \rho - \rho_v \beta_R \left(\frac{c_{d,t=1} - \beta_B + (p + \rho_w w_n)(\beta_B - \beta_R) + 1}{2\rho_v \beta_R(\beta_B - \beta_R)}\right) + \rho_w w_n \tag{24}$$

$$p_n = \frac{(\beta_B - \beta_R)(p + \rho_w w_n) - c_{d,t=1} + \beta_B - 1}{2(\beta_B - \beta_R)} \tag{25}$$

Next, I plug this expression, as well as the optimized value of V_n, into the profit function:

$$\pi_n^{d,t=1} = \beta_B V_n^* + \frac{(\beta_B - \beta_R)(p + \rho_w w_n) - c_{t=1} + \beta_B - 1}{2(\beta_B - \beta_R)}(\beta_R - \beta_B)V_n^* \tag{26}$$

$$-(1 + c_{d,t=1})V_n^* - F(d, t = 1)$$

This expression can be simplified and then the partial derivative taken with respect to w_n to find that:

$$\frac{\partial \pi_n}{\partial w_n} = -\frac{\rho_w(c_{d,t=1} - \beta_B\rho + \beta_B\rho_w w_n - \beta_B - \rho\beta_R - \beta_R\rho_w w_n + 1)}{2\beta_R\rho_v} \tag{27}$$

Re-writing and grouping terms, I then see that the marginal profit is increasing in the wealth of the borrower if the following condition from the numerator holds:

$$\frac{\partial \pi_n}{\partial w_n} = \rho_w(\beta_B(1 - p) + \rho_w w_n(\beta_R - \beta_B) + \rho\beta_R - (1 + c_{d,t=1})) > 0 \tag{28}$$

If the firm is to make a positive profit, I know that:

$$\pi_n^{d,t=1} = p_n(1 + r_n)V_n + (1 - p_n)\beta_B V_n - (1 + c_{d,t=1})V_n - F(d, t = 1) > 0 \tag{29}$$

If I factor out V_n, I see that this expression becomes:

$$\pi_n^{d,t=1} = V_n(p_n(1 + r_n) + (1 - p_n)\beta_B - (1 + c_{d,t=1})) - F(d, t = 1) > 0 \tag{30}$$

For the borrower to have a non-negative surplus, it must be that $\beta_R \geq 1 + r_n$, and utilizing that $F(d, t = 1)$ is non-negative, as well as that $\beta_R - \beta_B > 0$ by assumption, I get that the derivative of profit with respect to wealth is positive as:

$$\rho_w(\beta_B(1-p)+\rho_w w_n(\beta_R-\beta_B)+\rho\beta_R-(1+c_{d,t=1})) > \rho_w(\beta_B(1-p)+\rho(1+r_n)-(1+c_{d,t=1})) > 0 \tag{31}$$

where the last inequality comes from the assumption that the firm makes a positive profit. Thus, as long as the firm is making a positive profit, the profit expression is increasing in borrower wealth, showing Lemma 2.

□

Using this analysis of the optimal loan size and the increasing profit from wealthier borrowers, I generate the following with respect to the profit-maximizing firm behavior:

Proposition 1: In a monopoly, for-profit profit-maximizing firms will lend to all borrowers with $w > w^{d,t=1}$, where $\pi_n \mid_{w=w^{d,t=1}} = 0$.

The value of $w^{d,t=1}$ is: $w^{d,t=1} = \frac{1+c^{d,t=1}-\beta_B-p(\beta_R-\beta_B)+2\beta_R\rho_v\sqrt{\frac{F(d,t=1)(\beta_R-\beta_B)}{\beta_R\rho_v}}}{\rho_w(\beta_R-\beta_B)}$.

Proof. Proof of Proposition 1:

The proof can be simplified as the objectives of the firm and of the sources of financing are perfectly aligned. In other words, if the firm decides to accept deposits, then deposits are increasing in the average loan size. However, as I showed above, the more profitable borrowers are also the wealthier borrowers who are given larger loans, and thus the for-profit profit-maximizing firm will want to start lending to the wealthiest borrowers and continue down to lower wealth borrowers until the marginal borrower earns the firm no profit. Thus, I will simplify the analysis by leaving the cost as a general marginal cost c, and then the value of this c can be found afterwards by comparing whether lowering the marginal cost by using deposits is worth the increase in fixed cost.

To prove Proposition 1, I just need to find where the zero-profit point is, as the above lemmas have shown that profit is increasing in wealth and thus the firm will choose to lend to all borrowers above this point. In other words, for-profit profit-maximizing firms will lend to all borrowers with $w > w^{d,t=1}$, where $\pi_n \mid_{w=w^{d,t=1}} = 0$.

The value of $w^{d,t=1}$ can then be found by taking the optimized profit expression, setting it to zero, and then solving for w_n:

$$\pi_n^{d,t=1} = \beta_B V_n^* + \frac{(\beta_B - \beta_R)(p + \rho_w w_n) - c_{d,t=1} + \beta_B - 1}{2(\beta_B - \beta_R)}(\beta_R - \beta_B)V_n^* \tag{32}$$

$$-(1 + c_{d,t=1})V_n - F(d, t = 1) = 0$$

$$w^{d,t=1} = \frac{1 + c_{d,t=1} - \beta_B - p(\beta_R - \beta_B) + 2\beta_R\rho_v\sqrt{\frac{F(d,t=1)(\beta_R - \beta_B)}{\beta_R\rho_v}}}{\rho_w(\beta_R - \beta_B)} \tag{33}$$

□

In addition, I examine the financing choices, to find that:

Corollary 1: $w^{d=0,t=1} < w^{d=1,t=1}$ is a necessary but not sufficient condition for a for-profit profit-maximizing firm to choose to not accept deposits.

Proof. Proof of Corollary 1:

In the proof of Proposition 1, I did not make any assumptions about the choice of financing for the for-profit organization. Whether or not to accept deposits, which could potentially influence which borrowers the firm targets, would in fact not change the for-profit's behavior, as argued above due to alignment of firm and depositor interests. In order to examine whether profitability is higher or not when accepting deposits, I first need to calculate the total costs, C, of making a loan under each scenario:[24]

$$C_n(d, t = 1) = (1 + c_{d,t=1})V_n + F(d, t = 1) \tag{34}$$

[24] Note that because I assume linear costs, I can examine the cost of making an individual loan as opposed to summing over all borrowers and the result will be the same.

where $F(d, t = 1)$ is given by:

$$F(d, t = 1) = (f_1 + f_3)d + f_2 \tag{35}$$

and $c_{d,t=1}$ is given by:

$$c_{d,t=1} = c_2 B + c_3 E + c_4 D(\mu_j) \tag{36}$$

Also, recall that I endogenize the share of funding from deposits in the following way:

$$D(\mu_j) = \delta_1 + \delta_2 \mu_j \tag{37}$$

Note that because deposits are to some extent limited, the organization will only be solely financed by deposits if they are sufficiently available that no debt or equity is needed.

Because debt and equity are unbounded and have constant marginal costs, the firm will only be funded by either debt or equity, unless $c_2 = c_3$. To simplify analysis, I will assume $c_3 < c_2$ and thus the firm is solely financed by equity or by equity and deposits. The total cost with equity only is simply the marginal cost of equity times the total amount of funding raised plus the fixed cost:

$$C_n(d = 0, t = 1) = (1 + c_3)V_n + f_2 \tag{38}$$

If the organization accepts deposits, it is necessary (but not sufficient) that $c_4 < c_3$, because equity is assumed to not be capped, and accepting deposits increases the fixed costs, so it must be that the marginal cost of deposits is lower than the marginal cost of equity. Because of the lower marginal cost of deposits, if the organization decides to accept deposits, then it will use all available deposits and the rest of financing will come from equity. In other words, the share of funding from deposits will be given by the deposits function above, $D(\mu_j) = \delta_1 + \delta_2 \mu_j$ and the share of funding from equity will be the remaining share of funds that need to be raised:

$$E = 1 - D(\mu_j) = 1 - (\delta_1 + \delta_2 \mu_j) \tag{39}$$

Thus, I can calculate the marginal cost of capital through a weighted average:

$$c_n(d = 1, t = 1) = c_3(1 - (\delta_1 + \delta_2 \mu_j)) + c_4(\delta_1 + \delta_2 \mu_j) \tag{40}$$

which can be simplified and then added to the fixed cost expression to get the total cost:

$$C_n(d = 1, t = 1) = [c_3 - (c_3 - c_4)(\delta_1 + \delta_2 \mu_j)]V_n + f_1 + f_2 + f_3 \tag{41}$$

In terms of financing choices, the organization will choose to accept deposits when the total profit with deposits is greater than the total profit without deposits:

$$\int_{w_{d=1,t=1}}^{1} \pi_n(d = 1, t = 1)dw > \int_{w_{d=0,t=1}}^{1} \pi_n(d = 0, t = 1)dw \tag{42}$$

Notice that the total profit must be compared as opposed to just comparing costs from making a single loan as the wealth cut-offs will be different under deposit-taking. In particular, it must be that the non-deposit-taking firm lends to more borrowers for non-deposit-taking to be an optimal choice.

The proof is relatively straight forward using contradiction. Suppose that deposit-taking firms lend to additional borrowers. Then this means that at $w_{d=0,t=1}$, deposit-taking firms are still making a positive profit. However, profit is increasing in wealth and deposit-taking firms have a higher

slope of the marginal profit equation due to their lower marginal cost. I can see this analytically by taking the partial derivative of $\frac{\partial \pi_n}{\partial w_n}$ with respect to c:

$$\frac{\partial^2 \pi_n}{\partial w_n \partial c} = -\frac{\rho_w}{2\beta_R \rho_v} < 0 \tag{43}$$

Thus, not taking deposits cannot be optimal if deposit-taking firms reach more borrowers. The intuition is that deposit-taking is relatively better for making larger loans due to the lower marginal cost, and thus profits from higher income borrowers will be higher under deposit-taking. For non deposit-taking to be optimal, it must be that these higher profits at higher wealth levels under deposit taking are offset by lower profits from lower income borrowers. Thus, it must be that the non-deposit-taking firm still has a positive profit at the zero-profit point for the deposit-taking firm.

Diagram 1.1 illustrates this scenario. The solid line represents the deposit-taking marginal profit-line and the dotted line represents the non deposit-taking marginal profit line. The deposit-taking line is steeper due to the lower marginal cost. Thus, the higher marginal cost of the non-deposit-taking firm is associated with a smaller positive slope of the marginal profit line with respect to wealth. Non deposit-taking is potentially the optimal solution if $w_{d=0,t=1} < w_{d=1,t=1}$ as then the profit from not accepting deposits is $A + C$ as compared to $A + B$ from not accepting deposits. If $w_{d=1,t=1} < w_{d=0,t=1}$, then deposit-taking is always optimal as profit will be $A + B + C + D$ as compared to $A + C$ from not taking deposits.

□

INSERT Diagram 1.1

I then develop similar propositions for the other two firm types. First, I consider which borrowers for-profit client-maximizing firms will choose to serve in equilibrium:

Proposition 2: In a monopoly, for-profit[25] client-maximizing firms will lend to all borrowers with $w > w'^{d,t=1}$, where $\int_{w'(d,t=1)}^{1} \pi_n(d, t = 1)dw = 0$.

Proof. Proof of Proposition 2:

Proposition 2 repeats the monopoly analysis for for-profit client-maximizing firms. The intuition for for-profit client-maximizing firms is relatively straightforward. Because I assume that there exists some profitable borrowers, and because the firm has access to an unbounded supply of equity, then the firm will choose to lend to the same clients as profit-maximizing firms, but then continue to lend to lower income clients until the firm existence constraint binds, or: $\int_{w'd,t=1}^{1} \pi_n(d, t = 1)dw = 0$.

[25] This maximization problem as stated is somewhat problematic in that I am assuming that for-profits are financed by equity, but equity-holders would likely require some positive profit. The model can be generalized to require some minimum level of profit, although for-profits are thought to have better access to capital even outside of share-holders and thus the model as stated would still be applicable in this case.

This constraint must hold or else the firm has additional borrowers it could subsidize, and similarly, it will lend to the most profitable borrowers possible as this maximizes the number of borrowers reached until this constraint binds. □

Comparing Propositions 1 and 2, I find the following corollary:

Corollary 2: For-profit client-maximizing firms will serve more borrowers in a monopoly situation than for-profit profit-maximizing firms.

In other words, this corollary tells us that the market will be more broadly served in a monopoly by a client-maximizing firm than by a profit-maximizing firm. This is not a surprising condition as I have allowed client-maximizing firms to have the same financing advantages as profit-maximizing firms when they take on the for-profit status, and thus they will be able to serve all of the profitable borrowers that profit-maximizing firms serve as well as additional unprofitable borrowers until the net profit is zero.

Proof. Proof of Corollary 2:

Corollary 2 utilizes a simple proof by contradiction. Suppose the for-profit profit-maximizing firm is reaching strictly more borrowers than the for-profit client-maximizing firm. Then the client-maximizing firm could imitate the profit-maximizing firm in terms of borrowers targeted and sources of financing and increase the number of borrowers reached. This is a contradiction as it implies that the client-maximizing firm had not been maximizing its objective function.
□

The set-up regarding when the for-profit client-maximizing firm accepts deposits is the same as for the profit-maximizing firm in Corollary 1, the difference simply being the wealth cut-off used to determine the average loan size, which is needed to determine the share of deposits that can be raised. However, because the firm will subsidize borrowers until net profit is zero, the benefit of having the lower fixed cost and flatter marginal profit line of non-deposit-taking is relatively larger as it allows the firm to lend to the unprofitable borrowers more cheaply. Thus, I generate the following result:

Corollary 3: $w^{d=0,t=1} < w^{d=1,t=1}$ is a necessary and sufficient condition for a client-maximizing

firm to choose to not accept deposits, where $w^{d,t=1}$ is defined by: $\pi_n \mid_{w=w^{d,t=1}} = 0$.

Proof. Proof of Corollary 3:

This condition relies on the linearity of profit with respect to wealth. In other words, due to this linearity, I find that the client-maximizing firm will be able to serve twice as many borrowers as where the zero-profit point is, or $(1 - w'^{d,t=1}) = 1/2 * (1 - w^{d,t=1})$, where $\int_{w'^{d,t=1}}^{1} \pi_n(d, t = 1)dw = 0$ and $\pi_n \mid_{w=w^{d,t=1}} = 0$. Thus, since the goal of the client-maximizing firm is simply to maximize the number of borrowers reached, the firm will choose to not accept deposits if $w'^{d=0,t=1} < w'^{d=1,t=1}$, or equivalently, $w^{d=0,t=1} < w^{d=1,t=1}$.

The comparison between Corollaries 1 and 3 can be seen in Diagram 1.2. In this diagram, I see that while the necessary condition for the profit-maximizing firm to not accept deposits, $w^{d=0,t=1} < w^{d=1,t=1}$ is satisfied, the profit-maximizing firm would choose to accept deposits in this case as $A + B > A + C$. On the other hand, the same condition is both necessary and sufficient for the client-maximizing for-profit firm to not accept deposits, as $w'^{d=0,t=1} < w'^{d=1,t=1}$. Thus, in this scenario, the client-maximizing firm would not accept deposits whereas the profit-maximizing firm would.

INSERT Diagram 1.2

□

The important implication of Corollary 3 is that client-maximizing firms are more likely to not accept deposits. In addition, while the analysis of profit-maximizing and for-profit client-maximizing firms suggests that deposit-taking firms will have a higher average loan sizes, the fact that profit-maximizing firms also will be more likely to accept deposits increases the differences in targeting between deposit-taking and non-deposit-taking firms. Thus, differences in financing affect the borrowers targeted, but different objective functions also influence both borrower targeting and the choice of financing and strengthens this relationship.

Finally, I consider the optimal borrower targeting behavior of the non-profit client-maximizing firm. Because donations are a low-cost source of financing, and are higher for firms targeting relatively lower income borrowers, it is possible that the non-profit will actually not target the highest income borrowers. In other words, non-profit client-maximizing firms will lend to borrowers between w_H and w_L, where w_H and w_L are found by solving the following problem: $max\ [w_H - w_L]$ subject to the constraint that $\int_{w_L}^{w_H} \pi_n(d, t = 0)dw - G(\mu_j) \sum_{n=1}^{N_j} V_n = 0$ and $w_H \leq 1$ and $w_L \geq 0$.[26]

[26] For simplicity, I assume that the borrowers served have to be on a continuous interval, meaning the organization

The non-profit is thus maximizing the total number of borrowers it reaches by maximizing the length of the interval of borrowers served, captured by the distance between w_H and w_L. The firm existence constraint allows the firm to operate at a net negative profit equivalent to the amount of donations it receives. This is an important distinction from the for-profit condition as, under certain parameter values, it will be the case that $w_H < 1$, and thus, non-profit organizations may target different borrowers than for-profit organizations, even if they have the same objective function, due to the incentives provided by donors, generating the following proposition:

Proposition 3: Non-profit client-maximizing firms in a monopoly may not lend to the wealthiest borrowers.

Proof. Proof of Proposition 3:

This proof utilizes a proof by contradiction. Assume that the non-profit client-maximizing firm does lend to the wealthiest borrowers, and then show that in fact there exists different targeting behavior that would allow the firm to reach additional borrowers. Importantly, this proposition does not say that this always holds, but rather than under certain parameters it will hold, and it is sufficient to find one such counter-example. It is important that I endogenize the cost function before solving because the nature of the endogenized cost will determine which segment of the population the organization serves. Thus, the organization is trying to reach the most borrowers subject to the constraints holding, or:

$$max\ w_H - w_L \text{ where} \tag{44}$$

$$\int_{w_L}^{w_H} \pi_n(d, t=0) + G(\mu_j) \sum_{n=1}^{N_j} V_n = 0 \tag{45}$$

First, I can write out the profit function:

$$\pi_n(d, t=0) = (\rho - \rho_v V_n \beta_R + \rho_w w_n)\beta_R V_n + (1 - (\rho - \rho_v V_n \beta_R + \rho_w w_n))\beta_B V_n \tag{46}$$

$$-(1 + c_{d,t=0})V_n - F(d, t=0)$$

where the cost function will be defined through the weighted average cost of debt plus donations.[27] The share of debt used will be one less the share of donations:

$$B = 1 - G(\mu_j) = 1 - (M - \gamma\mu_j) \tag{47}$$

cannot target segmented, or disjoint, wealth levels of the population. While this assumption does prevent certain possible scenarios, it still allows for meaningful analysis to occur regarding the implications of sources of financing for borrower targeting.

[27] I consider the case where the firm does not accept deposits for simplicity. This is optimal if the marginal cost benefit is not large enough or the increase in fixed cost is sufficiently high.

$$c_{d=0,t=0} = c_2(1 - (M - \gamma\mu_j)) + c_1(M - \gamma\mu_j) \tag{48}$$

Thus, I can plug this into the profit expression as the marginal cost to get the constraint on my maximization problem:

$$\int_{w_L}^{w_H} \pi_n(d, t = 0)dw + (M - \gamma\mu_j) \sum_{n=1}^{N_j} V_n = 0 \tag{49}$$

and the optimal values are found by maximizing $w_H - w_L$ subject to this constraint.

To prove the proposition, I simply need to show that conditions exist where the organization may not want to target the highest income population. First, assume that the organization targets the highest income population. Then, the analysis will follow in a similar fashion as for the for-profit client-maximizing case except that the source of financing will be from donations and so the amount of funding outside of debt will be distinct. Since I assume that the organization is targeting the highest income population, I can treat the cost function as a constant and simply plug in the realized cost after optimizing. Then, the organization will lend to borrowers with $w > w^{d,t=0}$, where the cut-off is defined by $\int_{w^{d,t=0}}^{1} \pi_n(d, t = 0)dw + G(\mu_j)V_j = 0$.

However, consider if the organization instead lends to the very lowest income borrowers, or those with wealth such that $w < x^{d,t=0}$, where the cut-off is defined by $\int_0^{x^{d,t=0}} \pi_n(d, t = 0)dw + G(\mu_j)V_j = 0$. Then, I need to show that it is possible that:

$$x^{d,t=0} - 0 > 1 - w^{d,t=0} \tag{50}$$

Computing these outcomes, I find that this is possible if γ and $c_1 - c_2$ are sufficiently large. Thus, one way to interpret this result is that if the donors care enough about lending to low income borrowers, and donations are significantly cheaper relative to debt, as well as sufficiently available, then it is possible that the non-profit will not want to serve the most profitable, wealthiest segment of the population.

Diagram 1.3 illustrates a version of the decision process that goes along with the choice regarding whether or not to target the highest income borrowers. I show the process assuming that donations have the same marginal cost as debt. Thus, the key difference examined is that targeting lower income borrowers will lead to a higher donation amount, which will allow the firm to operate at more of a loss. Thus, the firm will chose to target w_H through w_L as opposed to $w_{d,t=0}$ to 1 if:

$$w_H - w_L > 1 - w_{d,t=0} \tag{51}$$

where this analysis can be simplified by noticing that the increase in donations from targeting a lower wealth segment will have to lead to more borrowers than $2 * (1 - w_H)$, due to the loss in borrowers due to losing profit at the highest income level. Thus, the total donation amount will have to change by more than $2 * A$ as the additional borrowers will come from an even less profitable segment and thus require additional subsidization, as seen in the diagram.

INSERT Diagram 1.3 □

Analysis of the non-profit is a bit more complicated than the for-profit client-maximizing institu-

tion because the incentives of the donors are not necessarily aligned with those of the organization. In other words, non-profits have access to donations that influence the borrowers the organization lends to, as donors prefer loans made to lower income borrowers. Recall that donations are capped and decreasing in the average wealth of the borrower served. Thus, I find that there is complementarity between the sources of financing and the types of borrowers targeted. In particular, the proposition above shows that the approach of assuming that the organization necessarily serves the wealthiest of borrowers and then continues down to lower wealth borrowers may no longer hold.

In order to examine a deposit-taking condition comparable to that found in Corollaries 1 and 3, I consider when the non-profit client-maximizing firm targets the highest income segment of the population. Because the non-profit not only will subsidize borrowers until net profit is zero but also will utilize additional donations to subsidize even more unprofitable borrowers, the flatter non deposit-taking line is even more useful for these borrowers than for the for-profit client-maximizing firm. As a result, I get the following corollary for the non-profit analysis:

Corollary 4: $z^{d=0,t=0} < z^{d=1,t=0}$ is *not* a necessary condition for a non-profit firm to choose to not accept deposits, where $z^{d,t=0}$ is defined through $\pi_n(d, t=0) \mid_{w=z^{d,t=0}} = 0$.

Proof. Proof of Corollary 4:

I use a proof by contradiction. Assume that $z^{d=0,t=0} < z^{d=1,t=0}$ is a necessary condition for a non-profit firm to choose to not accept deposits, then show that in fact it is possible that $z^{d=0,t=0} \geq z^{d=1,t=0}$ but the firm can actually lend to additional borrowers by not accepting deposits. Let $z^{d=0,t=0} = z^{d=1,t=0}$. Because of the linearity of profit with respect to wealth, the client-maximizing firm will be able to serve twice as many borrowers as where the zero-profit point is, or $(1 - w^{d,t=0}) = 1/2 * (1 - z^{d,t=0})$, where $\int_{w^{d,t=0}}^{1} \pi_n(d, t=0)dw = 0$ and $\pi_n \mid_{z=w^{d,t=0}} = 0$. Thus, without any donations, the firm would reach the same number of borrowers with deposit-taking and non-deposit taking, or since: $z^{d=0,t=0} = z^{d=1,t=0}$, then $1/2 * z^{d=0,t=0} = 1/2 * z^{d=1,t=0}$, and equivalently $w^{d=0,t=0} = w^{d=1,t=0}$. However, any amount of donations received will allow the non deposit-taking firm to reach additional borrowers relative to the deposit-taking firm as the higher slope of the deposit-taking marginal profit line means that if $z^{d=0,t=0} < z^{d=1,t=0}$, then for any $w < z^{d=0,t=0} = z^{d=1,t=0}$, the deposit-taking firm will have a more negative marginal profit and thus require additional subsidy. Thus, if $G(\mu_j) > 0$, the firm will strictly prefer to not accept deposits, despite the fact that $z^{d=0,t=0} < z^{d=1,t=0}$ does not hold.

Diagram 1.4 illustrates this scenario. In this diagram, I see that both a for-profit profit-maximizing and a for-profit client-maximizing firm would accept deposits as the zero-profit point for the deposit line is at a lower wealth level than that for the non-deposit line. However, the analysis differs for the non-profit firm due to donations. In particular, because the non-deposit-taking line is flatter, it means that the loss the firm faces when lending to very low income borrowers is less,[28] and thus donations can go farther in expanding outreach to these borrowers. In other words, despite the fact that if there were no donations, a deposit-taking firm would lend to additional borrowers due to its lower zero-profit point, it is possible that donations going farther with lower income borrowers when the firm does not accept deposits more than makes up for this difference. For instance, even if the same size donation is received by the deposit-taking and non-deposit taking firm, i.e. if $A + B + D = B + C$, the non-deposit taking firm may actually reach more borrowers, as seen in the diagram.[29]

INSERT Diagram 1.4 □

The implication of Corollary 4 is that non-profit client-maximizing firms are even more likely to not accept deposits that for-profit client-maximizing firms. Thus, while the analysis of for-profit and non-profit firms suggests that deposit-taking firms will have a higher average loan sizes, the fact that non-profit firms also will be less likely to accept deposits increases differences in targeting between deposit-taking and non-deposit-taking firms. Similarly, the differences in targeting between deposit-taking and non-deposit taking firms, as well as the difference in likelihood of accepting them by profit-status, will make differences in targeting between for-profit and non-profits even larger.

2.3 Numerical Monopoly Analysis

I assume that w follows a uniform distribution between 0 and 1. In addition, let the following parameter conditions hold:

- $\beta_R = 1.50$
- $\beta_B = 1$
- $\rho = 0.5$

[28] This stems from the lower fixed cost when not taking deposits.

[29] This analysis does not even allow the non-deposit-taking firm to decide to not target the very highest income borrowers, which is more appealing under non deposit-taking and would increase the benefit of not taking deposits in this case.

- $\rho_w = 0.5$
- $\rho_v = 0.0005$
- $c_3 = 0.25$

Then, consider three different values of the fixed cost. Under $F = 10$, I find in Table 1.2 that the for-profit client-maximizing firm will lend to the entire population, from $w = 0$ up to $w = 1$, whereas the for-profit profit-maximizing firm will lend to borrowers with wealth such that $w > 0.49$. If I double the fixed cost to $F = 20$, I find that the client-maximizing firm lends to borrowers with $w > 0.33$ and profit-maximizing firms lend to borrowers with wealth such that $w > 0.69$. Finally, at $F = 10$, the client-maximizing firm will lend to borrowers with $w > 0.69$ and profit-maximizing firms with $w > 0.85$. Thus, I find support of Corollary 2 that the client-maximizing firm will serve additional borrowers as compared to the profit-maximizing firm.

INSERT Table 1.2

Next, I introduce the possibility of deposits that have marginal cost of 0.20. In addition, because of the endogenous nature of deposit-taking, I need to specify the following parameters for the share of deposit-taking, given by $D(\mu_j) = \delta_1 + \delta_2 \mu_j$:

- $\delta_1 = .5$
- $\delta_2 = .5$

In addition, recall that deposits increase the fixed costs faced by the organization. Suppose the additional fixed cost is either 5 or 10. If $F = 10$, and the additional cost is 5, then I see in Table 1.3 that the for-profit profit-maximizing firm lends to borrowers with $w > 0.43$ and if the additional cost is 10, this number changes to $w > 0.52$. If $F = 20$, and the additional cost is 5, then the for-profit profit-maximizing firm lends to borrowers with $w > 0.59$ and if the additional cost is 10, this number changes to $w > 0.67$. Finally, if $F = 20$, and the additional cost is 5, then the for-profit profit-maximizing firm lends to borrowers with $w > 0.94$ and if the additional cost is 10, it is not profitable for the firm to enter the market.

INSERT Table 1.3

Thus, I see that when $F = 20$, the zero profit point is higher under non-deposit-taking, and thus both profit-maximizing and client-maximizing firms will choose to accept deposits. This is reflected in the higher profit and additional borrowers reached under deposit-taking. However, when $F = 10$ and the additional fixed cost from accepting deposits is 10 as well as when $F = 30$, the zero-profit point from not taking deposits is less than that from taking deposits. Based on Corollaries 1 and 3, this means that the client-maximizing firm will not want to accept deposits whereas the profit-maximizing firm may not want to, and actual profit levels need to be calculated to determine the decision. In this case, both profit-maximizing and client-maximizing firms will not want to accept deposits when $F = 30$, but profit-maximizing firms will want to accept deposits when $F = 10$.[30] Thus, I confirm the results from Corollaries 1 and 3 that profit-maximizing firms are more likely to accept deposits than client-maximizing firms.

For non-profit organizations, I need to specify additional conditions regarding the cost of funding:

- $c_1 = 0$
- $c_2 = 0.30$

Also, recall that donations were endogenous, and the share of donations were given by the following function: $G = M - \gamma\mu_j$, where I specify that:

- $M = 0.15$
- $\gamma = 0.15$

Non-profits have a lower fixed cost as specified in the model, and thus I examine the possible fixed levels of $F = 5, 15$, or 25. In addition, I again consider the possibility of deposits that follow the endogenous function specified before and have marginal cost of 0.20. Recall that deposits increase the fixed costs faced by the organization, and increase them even more for non-profits than for

[30] In this case, the client-maximizing firm can actually reach all borrowers in both cases, so it is technically indifferent between deposit-taking and non-deposit taking.

for-profits. Suppose the additional fixed cost is either 15 or 20. I find that the non-profit firm can lend to all borrowers under either deposit-taking or non deposit-taking if $F = 5$ or $F = 15$. However, if $F = 25$, and the organization targets the highest income population, then the non-deposit-taking firm lends to borrowers with $w > 0.74$. However, the deposit-taking firm, under the lower additional fixed cost scenario, still lends to all borrowers and lends to borrowers with $w > 0.24$ under the higher fixed cost scenario. Thus, the intuition is slightly different for non-profits firms, as donations means that the benefit from deposit-taking is not worthwhile to pursue until fixed costs become sufficiently high that the donations are less effective in subsidizing additional low income borrowers. Thus, donations and deposits are in some sense substitutes, as the level of fixed costs leads the organization to pursue deposits exactly when donations are less effective.[31]

INSERT Table 1.4

2.4 Duopoly Analysis

I next provide analysis for the duopoly case. While this continues to be a simplification of reality, it helps to provide insight into how the targeting and financing choices of organizations differ depending on the identity and approach of peer or competitor institutions. In other words, I compare the outcome when a non-profit co-exists with another non-profit versus with a for-profit institution. In addition, because the market has fairly low penetration, considering two firms as opposed to a larger number captures realistic competition between two firms competing in a given neighborhood or village. The results for the oligopoly and competitive situations will generalize from this analysis to generate hypotheses in the next section.

The approach I take is to assume that the market contains either two for-profit profit-maximizing firms, two non-profit client-maximizing firms, or one of each, to determine the resulting behavior under different parameter values.[32] I assume at borrower levels where the two firms overlap, they

[31] Note that this is a conservative analysis of the relationship because I do not consider the realistic scenario of non deposit-taking firms not targeting the highest borrower wealth levels.

[32] In further analysis, I also allow for for-profit client-maximizing firms.

still retain some price-setting behavior, although no longer perfectly price discriminate, as in the monopoly case. In particular, I assume that they can charge an interest rate of $\phi_0 + \frac{\phi_1}{J}$ and equally split demand with the other $J-1$ firms that co-exist at the wealth level.[33] In other words, this operationalization can be thought of as allowing some mark-up over a market rate, which is decreasing in the number of firms.[34] This means that the marginal profit for firm j of serving borrower n at a wealth level w_n where J firms[35] are competing at this wealth level is given by:

$$\pi_n^{d,t}(r_n, V_n, J) = p_n(1 + \phi_0 + \frac{\phi_1}{J})V_n + (1 - p_n)\beta_B V_n - (1 + c)V_n - F(d, t) \tag{52}$$

where the profit status is denoted $t \in \{0, 1\}$ and whether or not the firm accepts deposits is $d \in \{0, 1\}$. Then, firms can still set the loan size to maximize this marginal profit expression and choose the sources of financing and wealth of borrowers to target.

As opposed to McIntosh and Wydick (2005), who assume Bertrand competition between MFIs,[36] My approach can be thought of as a variant of the monopolistic competition model found in the banking literature, which has been discussed as the appropriate model of competition in this industry since Chandler (1938). The idea of these models is there is geographic differentiation along a circle, a la Salop (1979), such that banks have a local monopoly but profit is limited by the existence of differentiated, competing firms. This captures competition in microfinance where significant profit remains even when firms co-exist better than the stark result of a single competitor leading to zero profit as occurs in the Bertrand model.[37] In addition, it allows for meaningful

[33] While overly simplistic, this analysis still helps gain insight into the differentiation by firm type, which is the key of this paper. To the extent that price competition is more pronounced, it would make overlapping with competitors even less appealing and thus my findings of diversification are conservative.

[34] For instance, perhaps ϕ_0 is the relatively stable rate charged by commercial banks.

[35] Notice that this approach also simplifies the nature of competition in that the interest rate competition is not affected by the type of the competitor. However, competition with a for-profit as opposed to a non-profit will differ in which borrowers the competitor is serving. Again, this simplification would likely understate effects of differentiation by profit status, as for-profits are thought to compete more aggressively on price.

[36] Because of the strict assumption of Bertrand competition, moving from the monopoly to the duopoly case means that the interest rate set on the loan will be set such that the higher-cost MFI earns no profit.

[37] Note that with stricter competition assumptions, I would find less overlap in borrowers served. Thus, this is a conservative assumption and I still find differences in borrower targeting.

differentiation among microfinance institutions, which seems appropriate as MFI-borrower relationships in this industry persist rather than being anonymous, spot interactions.[38] The closing to the seminal work by Chandler (1938) is very much applicable to the localized competition among microfinance banks:

> The markets for time and savings deposits, for bank loans to customers, and for miscellaneous banking services do not meet the tests of pure competition. Banks sell highly differentiated, and not homogeneous, "products." For a variety of reasons individual customers tend to deal with the same bank over a period of time. Therefore, the bank has some degree of control over the price of its product. These markets also fail to meet the tests of pure competition in that there are so few banks "competing" for the same business - especially for the business of those customers whose opportunities are confined to local banks - that each bank is likely to take into consideration both its direct and its indirect effects on market price, and therefore to refrain from engaging in price competition designed to lure customers from other local banks. (Chandler, 1938)

As these conditions hold true in the microfinance industry,[39] I assume that there is a Salop circle for each level of wealth, so there is monopolistic competition at a given wealth level, and firms will still decide at which wealth levels to offer loans. Thus, I introduce competition but still allow for targeting of heterogeneous borrowers to be an important element of firm choice.

Given this set-up, the approach is to consider what the decision looks like for a given wealth of borrower, and then use this analysis to determine at which levels of wealth the firm will want to locate. Because of analytical complexity, I utilize a numerical analysis to develop the intuition of the duopoly case, after setting it up below.

[38] Further analysis should consider the repeated nature of lending in this industry as another important mechanism influencing firm behavior. However, the assumption of local monopolies implies borrowers stay with one lender and so this repeated behavior is captured to some extent in the current modeling approach.

[39] Many of the specific elements above have been referred to in either industry publications or mentioned in my interview work. For instance, one lending manager said, "Client retention can motivate an interest rate strategy" and discussed that while "market is a key factor" in determining interest rate, that other factors such as client retention and subsidizing through donations were still relevant (Source 1). In other words, competition did not completely determine the interest rate charged and the firm still retained some ability to set price.

2.4.1 Two For-Profit Profit-Maximizing Firms

First, I consider the case of two for-profit profit maximizing firms. Because my previous analysis examined the cut-off points above which firms want to lend, I want to ensure that this approach is still applicable. In other words, I want to check that when two firms co-exist, profit is still higher for wealthier borrowers. Thus, I provide the following:

Lemma 3: The duopoly profit when two for-profit profit-maximizing firms co-exist at a given wealth level is increasing in the wealth of the borrowers served.

Proof. Proof of Lemma 3:

The profit expression for a non-deposit taking for-profit profit-maximizing firm to lend to a borrower of wealth level w_n is given by:

$$\pi_n^{d,t}(r_n, V_n, J) = p_n(1 + \phi_0 + \frac{\phi_1}{J})V_n + (1 - p_n)\beta_B V_n - (1 + c_3)V_n - (f_0 + f_2) \tag{53}$$

Recall I have the default probability given by:

$$p_n(w_n, V_n, r_n) = \rho - \rho_v V_n(1 + r_n) + \rho_w w_n \tag{54}$$

where I can plug in the mark-up amount to get:

$$p_n(w_n, J) = \rho - \rho_v V_n(1 + \phi_0 + \frac{\phi_1}{J}) + \rho_w w_n \tag{55}$$

which means the profit expression will be:

$$\pi_n^{d,t}(w_n, J) = p_n(w_n, J)(1 + \phi_0 + \frac{\phi_1}{J})V_n + (1 - p_n(w_n, J))\beta_B V_n - \tag{56}$$

$$(1 + c)V_n - F(d, t)$$

However, note that this $\phi_0 + \frac{\phi_1}{J}$ is a constant with respect to the optimal loan size, and thus the proof from Lemmas 1 and 2 apply, as the interest rate was simply β_B, also a constant, in those proofs, and the profit expressions are otherwise identical. Thus, the loan size and profit will both be increasing in the wealth of the borrower served. □

While the prior lemma shows that if firms choose the same sources of financing, then they will see higher profit from lending to wealthier borrowers, I next examine the borrower targeting should the firms decide to pursue different sources of financing:

Proposition 5: If a deposit taking and a non-deposit taking for-profit profit-maximizing firm

co-exist in a market, then the non deposit-taking firm will target lower income borrowers.

Proof. Proof of Proposition 5:

Suppose Firm 1 decides to accept deposits and Firm 2 does not. I will use a proof by contradiction. Note that both firms will choose to lend to all borrowers above the relevant zero-profit threshold as profit is increasing in the wealth of the borrower as shown above. Assume that Firm 1 lends to weakly more borrowers than Firm 2, meaning that I assume that the deposit-taking firm targets a lower average income borrower. In other words, let Firm 1 lend to borrowers with wealth such that $w > w_1$ and Firm 2 lend to borrowers with wealth such that $w > w_2$, where $w_1 \leq w_2$. The marginal profit line for Firm 1 is increasing faster than that for Firm 2 as the only difference between the two at wealth levels where the co-exist will come from the difference in the marginal cost, or:

$$\frac{\partial \pi_n^{d=1,t}(w_n, J)}{\partial w_n} - \frac{\partial \pi_n^{d=0,t}(w_n, J)}{\partial w_n} = -(1 + c(d = 1, FP)) - (-(1 + c(d = 0, FP))) = \tag{57}$$

$$c(d = 0, FP) - c(d = 1, FP) > 0$$

since I assume that $c_4 < c_3$ and thus the marginal cost of the deposit-taking firm is below that of the non-deposit-taking firm. Thus, because Firm 1 has a marginal profit line that intersects at a lower wealth level and increases faster with wealth, it lies strictly above the marginal profit line of Firm 2. However, this is a contradiction as Firm 2 would then be better off accepting deposits and pursuing a symmetric equilibrium with Firm 1. Thus, the only way that firms will diverge in financing is if the non-deposit taking firm can profitably reach additional low income borrowers, making the average wealth of the borrower lower. □

This difference in the source of financing then can drive differences in the borrowers served. In particular, since I assume that deposits lower the marginal cost but raise the fixed cost of capital, then Proposition 5 shows that these financing differences could co-exist if Firm 2 can profitably serve poorer borrowers than Firm 1.[40] Thus, Firm 1 lends to borrowers with wealth such that $w > w_{d=1,t=1}$, and Firm 2 lends to borrowers with wealth such that $w > w_{d=0,t=1}$, where $w_{d=0,t=1} < w_{d=1,t=1}$, as mentioned above.

Using the interest rate from the mark-up function described earlier, I then plug this into the profit function and find the cut-off value above which the non-deposit-taking institutions will serve. Then, I compare Firm 2's profit in this scenario versus the profit in the symmetric deposit-taking

[40] The intuition is that because the firms are otherwise identical, it must be that they serve different borrowers for different sources of financing to persist in my model. Firm 1 will earn more profit on wealthier borrowers due to lower marginal cost, and thus it must be that Firm 2 can profitably reach lower income borrowers for those financing differences to persist. In many ways, the intuition is the same as for Corollary 1, as seen in Diagram 1.1.

duopoly and Firm 1's profit to that of the symmetric non deposit-taking duopoly to determine under what circumstances there will be differences within for-profits in terms of borrowers targeted due to differences in financing. Notice that in the case of mixed sources of financing there will be a segment of borrowers over which the non-deposit taking firm acts as a monopoly and a segment over which it acts as a duopoly, and thus profit needs to be summed over these two segments. In other words, there will be a deposit-taking for-profit co-existing with a non-deposit-taking for-profit if the following two conditions hold:

$$\int_{w_{d=1,t=1}}^{1} \pi_n(J=2,d=1,t=1) < \int_{w_{d=0,t=1}}^{w_{d=1,t=1}} \pi_n(J=1,d=0,t=1) + \int_{w_{d=1,t=1}}^{1} \pi_n(J=2,d=0,t=1) \tag{58}$$

$$\int_{w_{d=0,t=1}}^{1} \pi_n(J=2,d=0,t=1) < \int_{w_{d=1,t=1}}^{1} \pi_n(J=2,d=1,t=1) \tag{59}$$

In other words, the first condition ensures that Firm 2 would want to not accept deposits given that Firm 1 is accepting deposits and the second equation ensures that Firm 1 would want to accept deposits given that Firm 2 is not accepting deposits. Thus, I can plug in the optimized interest rates and values of the thresholds to evaluate when these conditions hold. Given the analytical complexity, I withhold analysis of the conditions and examine possible scenarios in the numerical analysis.

2.4.2 Two Non-Profit Client-Maximizing Firms

Next, I consider that two non-profit client-maximizing firms co-exist. Note that just because both organizations want to maximize the number of clients served, this does not mean that they will not compete over borrowers.[41] If the two firms co-exist, then they will lend to all borrowers above a threshold, where the threshold is defined by where the net profit is exactly offset by the amount of donations received.

[41] This is a conservative estimate of competition, as potentially there is also direct competition if the total amount of donations is capped at the country or even industry level as opposed to at the firm level. However, because donations are based on the type of borrowers served, pursuing donations can still increase competition through the borrowers targeted.

Recall that the profit expression is given by:

$$\pi_n^{d,t}(r_n, V_n, J) = p_n(1 + \phi_0 + \frac{\phi_1}{J})V_n + (1 - p_n)\beta_B V_n - (1 + c)V_n - F(d, t) \tag{60}$$

Notice that differentiation can occur, with the two non-profits expanding total outreach as compared to the monopoly non-profit, even though I do not assume any direct utility for the firms to collude.[42] Then, I can consider under what circumstances I will get differences in financing, and this result will be comparable to the for-profit case. In particular, if a non-profit decides to take deposits, they will have a higher average loan size as the steeper marginal cost curve means they are more equipped to make larger loans to wealthier borrowers.[43] In order to solve this, I would compare the number of borrowers reached if they decide to serve the same borrowers versus the number of borrowers reached if they differentiate, where the deposit-taking firm will lend to a higher income segment of borrowers, on average, then the non deposit-taking firm. Thus, I assume that the non-deposit taking firm serves $w_{L,d=0}$ to $w_{H,d=0}$ and the deposit-taking firm serves $w_{L,d=1}$ to $w_{H,d=1}$, where $w_{L,d=0} \leq w_{L,d=1}$ and $w_{H,d=0} \leq w_{H,d=1}$, because the firms would only pursue different sources of financing if they are serving different borrowers. The thresholds can be defined as:

$$\int_{w_{L,d=0}}^{w_{L,d=1}} \pi_n(J = 1, d = 0) + \int_{w_{L,d=1}}^{w_{H,d=0}} \pi_n(J = 2, d = 0) + G(\mu_j) \sum_{n=1}^{N_j} V_n = 0 \tag{61}$$

$$\int_{w_{L,d=1}}^{w_{H,d=0}} \pi_n(J = 2, d = 1) + \int_{w_{H,d=0}}^{w_{H,d=1}} \pi_n(J = 1, d = 1) + G(\mu_j) \sum_{n=1}^{N_j} V_n = 0 \tag{62}$$

This scenario will occur if both of these firms are serving more borrowers than they would if they were to deviate:

$$w_{H,d=1} - w_{L,d=1} \geq w_H - w_L \tag{63}$$

$$w_{H,d=0} - w_{L,d=0} \geq w'_H - w'_L \tag{64}$$

[42] In other words, an alternative approach to model non-profit behavior is that they care about the total number of borrowers reached by all firms rather than just focusing on their own outreach. This approach would make differentiation even more likely, and thus findings of differentiation in my model are relatively conservative.

[43] Note that because donations are assumed to be costless to pursue, both organizations will obtain some amount of donations, and thus this is not treated like deposit-taking, where I consider the binary choice of whether or not to pursue deposits.

where w_H and w_L denote the duopoly borrower cut-offs when both firms accept deposits and $w_{H'}$ and $w_{L'}$ denote the borrower cut-offs when both firms do not accept deposits. In other words, the first condition is ensuring that one firm would want to not accept deposits given that the other is accepting deposits and the second equation ensures that the deposit-taking firm would want to accept deposits given that the other is not accepting deposits. Thus, I can plug in the optimized interest rates and values of the thresholds to evaluate when these conditions would hold. Given the analytical complexity, I will withhold analysis of the conditions and examine possible scenarios in the numerical analysis.

2.4.3 One For-Profit Profit-Maximizing Firm, One Non-Profit Client-Maximizing Firm

Finally, I consider perhaps the most realistic case which is the co-existence of a non-profit firm with a for-profit profit-maximizing firm. This scenario captures the increasing commercial competition that NGOs are facing in many countries. Consider a wealth level at which both firms co-exist. Despite the fact that the firms have different objectives, the analysis will still be comparable to the two cases analyzed above when they co-exist at a given wealth level. While I still assume that for-profits will lend to borrowers with wealth above $w_{d,t=1}$, I cannot assume that non-profits will necessarily target the highest income borrowers. Thus, suppose that non-profits lend to borrowers between $w_{d,L}$ and $w_{d,H}$, where $w_{d,L} \leq w_{d,t=1}$, and $w_{d,H} \leq 1$.[44] I can solve for $w_{d,t=1}$ by then examining where the profit function in the duopoly case is equal to zero, and thus will get the same cut-off point as when two for-profit firms co-existed. Then $w_{d,L}$ and $w_{d,H}$ can be found by solving: $max\ w_{d,H} - w_{d,L}$ subject to the constraint that $\int_{w_{d,L}}^{w_{d,H}} \pi_n(d, t=0)dw + G(\mu_j)\sum_{n=1}^{N_j} V_n = 0$, where the profit function will be split up as a monopoly between $w_{d,L}$ and $w_{d,t=1}$ and a duopoly above that. Importantly, I will consider when $w_{d,H} < 1$, or under what circumstances non-profits choose not to lend to the highest income borrowers.

[44] While I am simplifying analysis, if I assume that firms have the choice of profit status, then $w_{d,L} < w_{d,t=1}$ is a benign assumption because if the opposite were to be true, then the organization could lend to additional borrowers by instead converting to the for-profit status, which would contradict that the firm was client-maximizing.

I could then consider under what circumstances I will get differences in financing. First, the for-profit will want to accept deposits if the profit from accepting deposits is greater than the profit of not accepting deposits conditional on the non-profit's behavior. The amount of overlap will potentially differ from the duopoly with two for-profits, so this will be a matter of comparing the following:

$$\int_{w_{d=1,t=1}}^{w_{d,H}} \pi_n(J=2,d=1,t=1) + \int_{w_{d,H}}^{1} \pi_n(J=1,d=1,t=1) > \tag{65}$$

$$\int_{w_{d=1,t=1}}^{w_{d,H}} \pi_n(J=2,d=0,t=1) + \int_{w_{d,H}}^{1} \pi_n(J=1,d=0,t=1)$$

Because there is potentially less overlap at the highest income borrowers, the incentive to accept deposits will be higher for the for-profits firm as compared to when it was competing with another for-profit firm.

A non-profit will want to accept deposits when the for-profit accepts deposits when the number of borrowers reached by doing so is higher, or:

$$w_{d=1,H} - w_{d=1,L} > w_{d=0,H} - w_{d=0,L} \tag{66}$$

where these thresholds are defined as:

$$\int_{w_{d=1,L}}^{w_{d=1,t=1}} \pi_n(J=1,d=1,t=0) + \int_{w_{d=1,t=1}}^{w_{d=1,H}} \pi_n(J=2,d=1,t=0) + G(\mu_j)\sum_{n=1}^{N_j} V_n = 0 \tag{67}$$

$$\int_{w_{d=0,L}}^{w_{d=1,t=1}} \pi_n(J=1,d=0,t=0) + \int_{w_{d=1,t=1}}^{w_{d=0,H}} \pi_n(J=2,d=0,t=0) + G(\mu_j)\sum_{n=1}^{N_j} V_n = 0 \tag{68}$$

Comparing these values, I can show that when a for-profit accepts deposits and a non-profit does not, differences in wealth segments targeted will be larger than when both types of organizations pursue the same sources of financing. In other words, I want to show that the cut-offs are such that the non-profit will lend to relatively lower income borrowers when it does not accept deposits, or that: $w_{d=1,t=1} > w_{d=0,t=1}$.

2.5 Numerical Duopoly Analysis

I present a numerical example to show under the specified parameter values, which borrowers the profit-maximizing for-profits and client-maximizing non-profits target.

I follow the same numerical assumptions as before, where $\beta_R = 1.50$, $\beta_B = 1$, $\rho = 0.5$, $\rho_w = 0.5$, and $\rho_v = 0.0005$. In addition, I assume $r_n = 0.3 + 0.2/J$, so that the mark-up is 0.5 in a monopoly, matching the analysis done previously as this is the same at the repayment return, β_R, and 0.4 in a duopoly. Then, I again consider different values of the fixed costs to understand firm behavior in different scenarios. In addition, I consider whether or not the firms will pursue deposits. Thus, I gather insight into when borrowers accept deposits and the types of borrowers targeted depending on whether they are competing with for-profit or non-profit organizations.

For instance, if I consider two for-profit profit-maximizing firms, then whether or not deposit-taking will be pursued depends on the relative gain in marginal cost versus the loss in fixed cost, as seen in Table 1.5. I find that under $F = 10, 20$, and 30, the profit-maximizing firms want to accept deposits regardless of whether it adds an additional fixed cost of 5 or 10. Notice that this is true despite the fact that the profit-maximizing monopolist would prefer to not accepts deposits when $F = 30$. This suggests that the gains to deposit-taking are actually higher for a profit-maximizing firm in a duopoly because the profitability benefit to having lower costs of financing is more important when firms are more limited in the interest rates they can charge.

INSERT Table 1.5

I follow a similar parametrization for non-profit organizations. In Table 1.6, I see that the non-profit organization would want to accept deposits if $F = 15$ or $F = 20$, but would not want to accept deposits in the low-cost scenario, where $F = 5$. The intuition behind this result is that when the fixed cost is fairly low for non-deposit taking, the effect of adding 15 or 20 to that cost makes it relatively more costly for the organization to reach additional borrowers, despite the lower fixed cost. However, when the fixed cost is higher to begin with for non deposit-taking, adding 15

or 20 has less of a relative effect.

INSERT Table 1.6

In addition, I find support for my results regarding differentiation. For instance, in the $F = 30$ case, where taking deposits adds 5 in fixed cost, I see in Tables 1.2 and 1.3 that the for-profit profit-maximizing monopoly would rather not accept deposits, to earn profit of $0.86 > 0.16$. However, in the duopoly case, if I assume two for-profit profit-maximizing firms target the same borrowers, then they will choose to accept deposits, earning a small positive profit. Thus, I see that one firm will have the incentive to not take deposits and lend as a monopolist down to the zero-profit cut-off point, earning slightly less than the 0.86 profit earned as a monopolist, given that the firm will still have to co-exist with the deposit-taking firm among the very wealthy borrowers. I find that differentiation will occur in this case, in terms of the sources of financing pursues, and the non deposit-taking firm will lend to lower income borrowers than the deposit-taking firm.

2.6 Hypotheses Development

The first hypothesis explores the finding of my model regarding the different borrowers that for-profit and non-profit organizations may choose to target. First, to the extent that profit-maximizing and client-maximizing firms co-exist, I expect that the client-maximizing firms will target a lower income segment of the population. Proposition 3 suggests that non-profit organizations may target a lower income segment of the population even as a monopoly. If the non-profit firm coexists with a profit-maximizing organization, then competition over wealthier borrowers will mean that the non-profit is even more inclined to serve a different, lower-income segment. In addition, even if I consider the case of two client-maximizing firms co-existing, due to the effects of the endogenous sources of financing, they may choose different profit-statuses and pursue different sources of financing. Thus, both of these effects will go in the same direction and lead to the following hypothesis regarding segmentation:

Hypothesis 1: For-profit and non-profit firms will be differentiated in the wealth of borrowers

served, with non-profit firms lending to lower-income borrowers than for-profit firms.

The second hypothesis considers how cross-country variance in the percentage of loans made by for-profit organizations will relate to non-profit loan size and financing choices. Higher prevalence of for-profit institutions could result from differences in either borrower or firm characteristics. More specifically, it could be that: 1) a higher percentage of borrowers are profitable which leads to more for-profit entry, or 2) cost advantages favor the for-profit form, such as relatively cheaper equity, a small fixed cost barrier to for-profit entry, or relatively costly or less available donations. These factors will lead to not only the endogenous entry of profit-maximizing for-profit firms but also client-maximizing firms will be more likely to choose the for-profit status. This might make one think that because the environment is relatively more accommodating to for-profits that there will be convergence on borrowers and approaches pursued. However, because client-maximizing firms are allowed to also choose the for-profit status, the firms that actually choose the non-profit status will, in fact, have smaller loan sizes and will be less likely to pursue deposits.[45] Thus, I generate the following hypothesis:

Hypothesis 2: A higher prevalence of for-profit firms will be associated with smaller loans and a lower incidence of deposit-taking by non-profit organizations.

Next, I further explore the role of alternative financing sources. My model endogenizes the amount of deposits in such a way that larger loan sizes are rewarded with additional deposits, potentially off-setting the fixed costs that taking deposits required. As a result, I expect that firms that accept deposits will be differentiated in average loan size, with those accepting deposits making on average larger loans, as is suggested in Corollaries 1, 3, and 4. However, because for-profits may already be serving the highest income borrowers, this effect will be stronger in non-profit organizations. In addition, to the extent that non-profits are switching from donations, which reward serving lower income borrowers, to deposits, which reward serving higher income borrowers, this

[45] Note that this also suggests that not allowing deposit-taking for non-profits should be associated with a higher prevalence of for-profit organizations. This is a result I plan to pursue in future analysis as I can exploit country-level regulatory changes regarding non-profit deposit-taking.

will strengthen the finding of differentiation between non-profit deposit-taking and non deposit-taking institutions:

Hypothesis 3: Firms that accept deposits will have larger average loan sizes than those that do not accept deposits, and this effect will be stronger in non-profit organizations.

2.7 Extensions

There are a number of limitations of the current model set-up that could be worthwhile extensions of the model. I will discuss a few of the possible extensions below that are most relevant to pursue.

Market Penetration, Transportation Costs, and Oligopolies:

The most significant simplification of my analysis is in the assumption of the nature and form of competition. I see three major dimensions which could be generalized and extended from my current analysis and are relevant given details of the microfinance market. First, I do not include the possibility of transportation costs, which are potentially important given that they form one of the major cost components of making and receiving microfinance loans. In addition, it is a dimension where I might find additional differentiation between for-profit and non-profit organizations, as non-profits are more likely to send loan officers out to rural villages, facing higher transportation costs, whereas for-profit organizations tend to locate in more urban areas where transportation costs are lower. Thus, this is another dimension along which differences between firms by profit status may endogenously show up.

Next, I assume that the market is such that if two firms target the same wealth of borrowers, they necessarily split demand. However, market penetration rates are fairly low in this growing industry. In other words, it seems plausible that targeting the same wealth of borrowers is not a sufficient condition for direct competition and there could be useful analysis by weakening this assumption. While the intuition of the model would remain the same, modeling the way in which the industry grows with varying market penetration rates could generate useful analysis, as this

"out-of-equilibrium" state is not short-lived.

Finally, to make the results tractable, I limit analysis to a monopoly and duopoly. While this generates understanding regarding how the different firm types interact, it is clearly incomplete and extending this to the more general oligopoly setting merits further consideration. While I have not solved out these extensions, I present below a potential set-up to address these three issues:

Assume that firms position themselves along a Hotelling line, where the line represents the borrowers' wealth. In order words, firms differentiate themselves in how close they locate to a wealth segment. Then, the firms face transportation costs to reach the borrowers. Thus, firms can still choose which borrowers to target, but they position themselves to serve certain borrowers at a lower cost. In addition, I assume that there is only a certain percentage of the population which is served, capturing the fact that market penetration is relatively low as microfinance is a growing industry. For example, suppose there is some probability $1 - \theta$ that the firm will make an offer to a borrower that is not being made an offer by any other firm, even if the firms are lending to borrowers at the same wealth level. Thus, θ can be thought of as the market penetration. This analysis would allow multiple firms to compete in an environment with transportation costs and potentially low market penetration.

Entry:

In the current analysis, I assume a duopoly and then my hypotheses are generalized from this case by considering how additional firms would affect firm behavior. However, I do not directly account for the fact that this entry, both in terms of the number of firms and the composition, will be endogenous both to institutional factors and the current firm composition and behavior. This is an important place for further investigation as I could imagine a scenario where non-profit organizations behave differently in order to deter for-profit entry. In the empirical work, I use country-year fixed effects to control for some of these effects. In addition, to the extent that firms want to deter entry, I would expect that this would lessen differentiation by profit-status and thus would only weaken the results of my model, suggesting that empirical support of differentiation

by profit status is robust to this effect. Similarly, if the institutional characteristics make lending to wealthier borrowers relatively more profitable, this could induce for-profit entry but would also imply that non-profits want to lend to wealthier borrowers, thus counter-acting my Hypothesis 2. Again, I expect empirical support of Hypothesis 2 to thus be robust to this effect.

Welfare Analysis:

While I have indirectly considered welfare analysis by looking at the number of borrowers reached, I have not directly focused my analysis on the total or social welfare implications of the different combinations of firms and conditions. This would require specifying a utility function for borrowers. I have avoided this approach as making utility comparisons across people is challenging. However, I could easily consider total surplus analysis, and this would be a relatively straightforward endeavor, using the profit and borrower surplus functions that I specified in the model. While this paper focuses on the strategic actions of the firms, welfare analysis would be useful to generate policy implications as well as provide connections with the literature on microfinance from development economics.

3 Empirical Analysis

3.1 Data

In order to test the above propositions, I utilize MIX Market Data, which is publicly available annual data that microfinance firms file voluntarily.[46] The firms that voluntarily chose to file tend to be larger and more financially transparent firms, and while this is a subsample of firms, it captures a large percentage of the industry activity (Cull *et al.,* 2011; Bogan, 2012). The current sample used in this paper covers institutions from 2003 through 2012. I focus on just the region of Latin America, as region influences the development of microcredit (Ahlin *et al.,* 2011). My entire sample has 3,186 observations, covering 522 firms in 25 countries. Firms are in the sample for an average of 4.23 years and countries have on average just under 16 firms in a given year. Commercialization

[46] This data can be accessed through the MIX Market portal, by selecting to download the Basic MIX MFI Data Set: http://www.mixmarket.org/profiles-reports.

in the industry is captured by the increasing share of loans being made by for-profit institutions, as can be seen in Figure 1.1, where both for-profit and non-profit firms are growing in terms of total loan amount, but for-profits are growing at a higher rate.

INSERT Figure 1.1

3.2 Variables

For-Profit Indicator is a variable taken directly from the MIX dataset which is defined as one if the organization is a for-profit as of its latest filing.[47]

Deposits Indicator is an indicator which is defined as one if an organization takes a positive amount of deposits in a given year, using the *Deposits* variable in MIX. Because taking deposits is viewed in my model as a choice where the fixed cost of pursuing this source of financing is relevant, I utilize this dummy variable approach rather than using the amount of deposits as a continuous variable.

Average Loan Balance per Borrower is the average balance of loans for a given borrower as provided to MIX Market in US Dollars. It is used in prior literature as a proxy for the wealth of the borrower served, and my model shows in Lemma 1 that this is an appropriate interpretation of the variable.

Percent For-Profit is a continuous variable which is defined as the ratio of the gross loan portfolio of all for-profit MFIs in a given country and year over the total gross loan portfolio of all MFIs in that country and year. It captures the extent to which loans made by peer firms in the country and year are made by for-profits.

[47] Unfortunately, I do not capture whether that organization was founded as a for-profit or whether it underwent a status change, but this would be a place where follow-up analysis with additional data would be useful, as suggested by Battilana & Dorado (2010).

3.3 Descriptive Statistics

In Table 1.7, I provide basic summary statistics of the variables in my sample, broken down by profit status. I see a number of relationships that are consistent with what I would expect based on my model, although I should be careful in the interpretation as organizational types exist in higher numbers in different countries, where microfinance conditions also differ. First, I see that non-profit organizations have a smaller average loan balance, which supports the notion that they are more likely to target a lower-income and more underserved population. In addition, for-profit organizations tend to have larger amounts of deposits and more equity, which is consistent with the financing differences between the organizations. For-profits also tend to be much larger when considering the number of active borrowers.

INSERT Table 1.7

In Table 1.8, I provide the correlation table, by profit status, for the key variables of interest with the percent of the total loans made by for-profits in a given country and year. If I look at how the average loan balance correlates with the other variables, I see that for both for-profit and non-profit organization, average loan size is negatively related to the yield on gross portfolio, supporting the idea that smaller loans are considered relatively riskier or higher cost and thus have a higher interest rate. In addition, there is a positive relationship between average loan size and the deposits indicator, consistent with the endogenous form of the deposits function that I specify in my model. Finally, I see that non-profit organizations' average loan size is negatively related to the percentage of loans made by for-profit firms in the same country-year, whereas it is positively related for for-profit organizations. This provides preliminary support for Hypothesis 2, suggesting that there is increased segmentation by profit-status when there is a higher prevalence of for-profit firms.

INSERT Table 1.8

3.4 Analysis

To examine Hypothesis 1, I run a regression of the average loan balance per borrower on profit status in Table 1.9. Models 1 through 3 are examining whether Hypothesis 1 holds, where for-profit and non-profit organizations segment the market in terms of the wealth of the borrowers served. Model 1 has year fixed effects, Model 2 has year and country fixed effects, and Model 3 has fixed effects for country*year. I find in all three models that the for-profit indicator has a positive and significant coefficient, indicating that for-profit institutions have a higher average loan balance than non-profit institutions, and thus suggesting that for-profits tend to target wealthier borrowers.

INSERT Table 1.9

To examine Hypothesis 2, I add the variable capturing the percentage of loans made by for-profit institutions in a given country-year, along with the interaction of this variable with the for-profit indicator. In Table 1.10, Models 1 and 2 have year and year and country fixed effects, respectively.[48] I find that the coefficient of the variable capturing the share of loans made by for-profits is negative and significant, and the coefficient of this variable interacted with the for-profit status is positive and significant. The magnitude of the interaction variable is greater than that of the share variable alone. This result implies that non-profit organizations have even smaller loan sizes when there is a higher share of for-profit organizations, whereas for-profit firms have weakly larger loan sizes. Thus, I find support for the first part of the hypothesis that differentiation increases between for-profit and non-profit firms as the share of loans made by for-profit organizations increases.

INSERT Table 1.10

To examine the second part of the hypothesis, I then repeat this analysis with the deposits indicator as the dependent variable. In Table 1.10, Models 3 and 4 have year and year and country fixed effects, respectively. In Model 4, I find that the coefficient of the variable capturing the share

[48] Note that I do not run this analysis with the country*year fixed effects as the main variable of interest is at the country-year level.

of loans made by for-profits is negative and significant, and the coefficient of this variable interacted with the for-profit status is positive and significant. Again, the magnitude of the interaction variable is greater than that of the share variable alone. In Model 3, the first coefficient is negative and insignificant while the second is positive and significant, and of a greater magnitude. This result provides some support for non-profit organizations being even less likely to accept deposits when there is a higher share of for-profit organizations.

Finally, to examine Hypothesis 3, I again look at the average loan balance per borrower, broken out by profit status, whether or not the firm takes deposits, and an interaction of the two. In Table 1.11, Models 1 through 3 look at the effect of these variables on the average loan balance, utilizing year fixed effects, year and country fixed effects, and year*country fixed effects, respectively. I find that deposit-taking institutions have larger average loan sizes than non deposit-taking institutions due to the positive coefficient on the deposits indicator. However, this effect is moderated for for-profit institutions in Models 2 and 3, indicating that for-profits deposit-taking institutions have larger loan sizes than for-profit non deposit-taking institutions, but the relative difference is smaller than when comparing non-profit deposit-taking and non deposit-taking institutions. Thus, I find support for Hypothesis 3.

INSERT Table 1.11

4 Conclusion

The existing literature is mixed regarding whether or not for-profit and non-profit organizations have different objectives (e.g. Duggan, 2000; Horwitz & Nichols, 2009). In my analytical model of the microfinance industry, I allow differences between for-profit and non-profit organizations to come not only from different objectives but also from the impact and demands of different sources of financing. As a result, differences by profit status may occur even when organizations have the same objective. This may help to explain some of the conflicting literature, and importantly incorporates the findings that sources of financing are relevant in determining non-profit behavior (Froelich, 1999; Weisbrod, 2004). Correlational analysis from a frequently used dataset of microfi-

nance organizations supports the hypotheses generated from the model and suggest that sources of financing and profit status are important dimensions to consider regarding how firms will behave in different markets.

As non-profits face increasing competition from for-profit firms, there is a question of where the non-profit form ought to fit in. A former CEO of a microfinance network suggested that the non-profit business model is still useful, and should not be completely disregarded, but rather transitioned into a different role in the industry. When thinking about the general industry development, NGOs used donations to test the feasibility of expanding lending to underserved borrowers in the early stages of microfinance. In fact, they did such a good job that commercial entrants saw the potential profitability and entered the industry and borrower segment (Karlan, 2014). In general, these for-profit entrants have better structure and financial support to grow, and thus non-profits perhaps ought to consider continuing to expand in other ways that are consistent with the comparative advantages of the non-profit business model.

Many non-profits are acquiring additional donations to experiment with providing health services. This is a result of the fact that their business models are better designed to do more exploratory, unprofitable work as compared to more commercially funded organizations, and also because donors are more willing to fund these projects than continuing to fund traditional microcredit NGOs, where they are increasingly focusing on providing only startup costs (Armendriz de Aghion & Morduch, 2004). Thus, even if the non-profit business model is in fact less able to serve the more developed and proven areas of microfinance, the business model can continue to have a competitive advantage in exploring new areas of service provision to underserved clients, as dictated by the providers of their unique source of financing.

Diagram 1.1

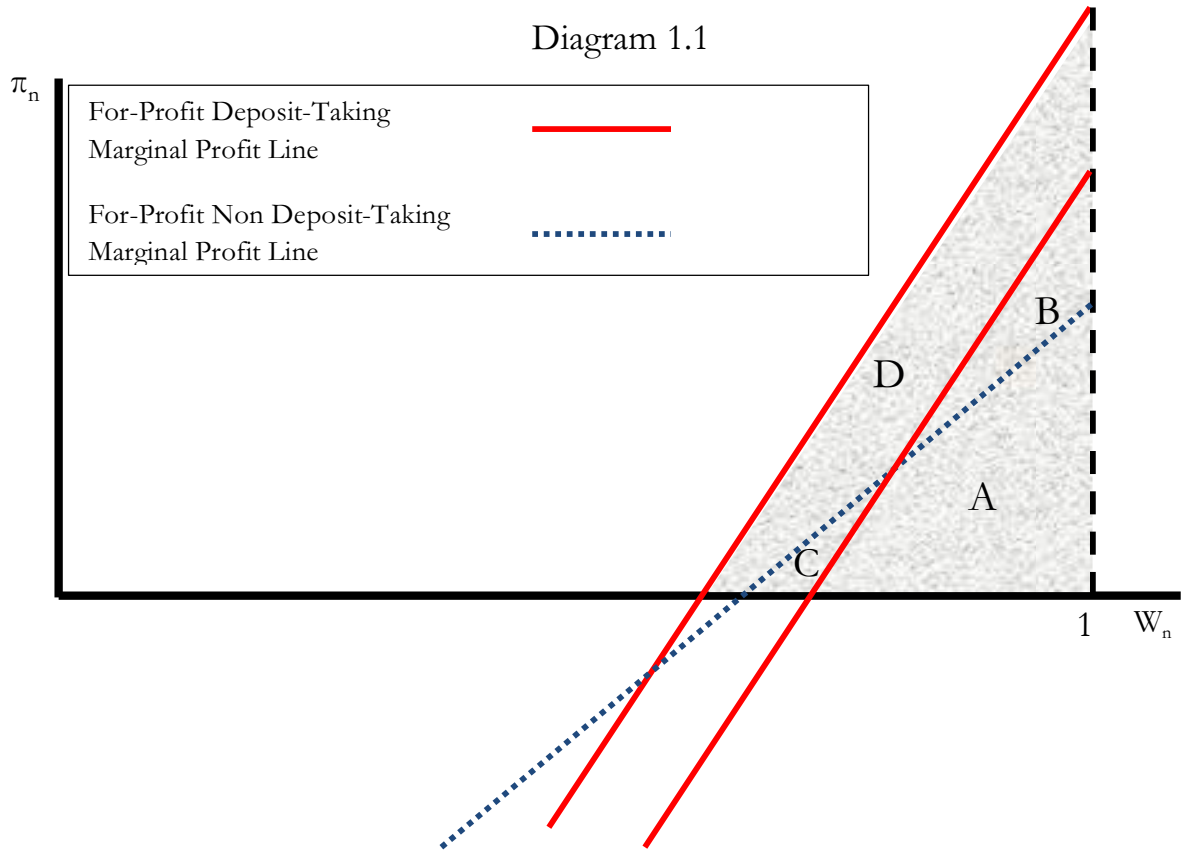

π_n
For-Profit Deposit-Taking
Marginal Profit Line
For-Profit Non Deposit-Taking
Marginal Profit Line
B
D
A
C
1
W_n

Diagram 1.2

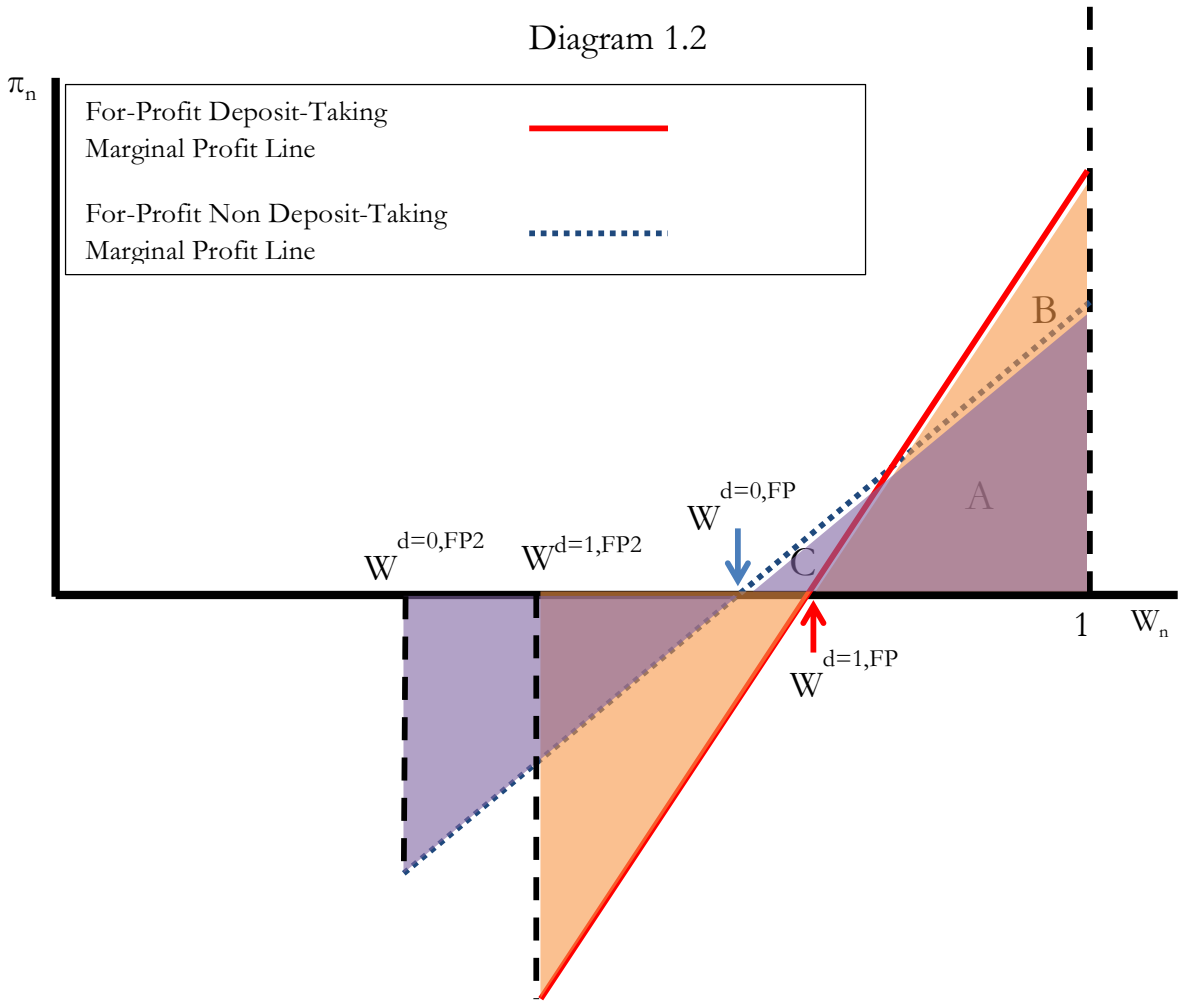

π_n
For-Profit Deposit-Taking Marginal Profit Line
For-Profit Non Deposit-Taking Marginal Profit Line
B
A
C
$W^{d=0,FP}$
$W^{d=0,FP2}$
$W^{d=1,FP2}$
$W^{d=1,FP}$
1
W_n

Diagram 1.3

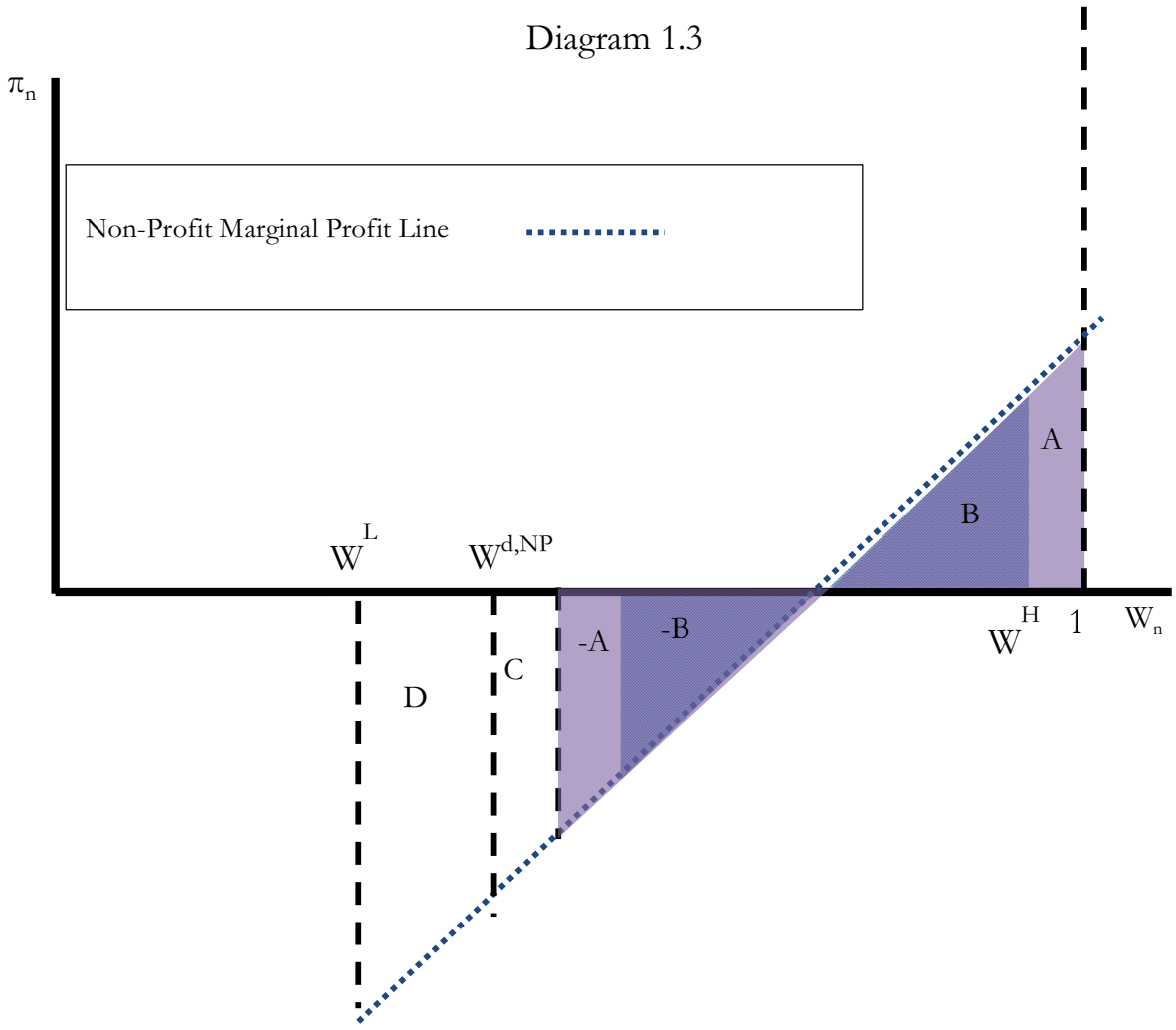
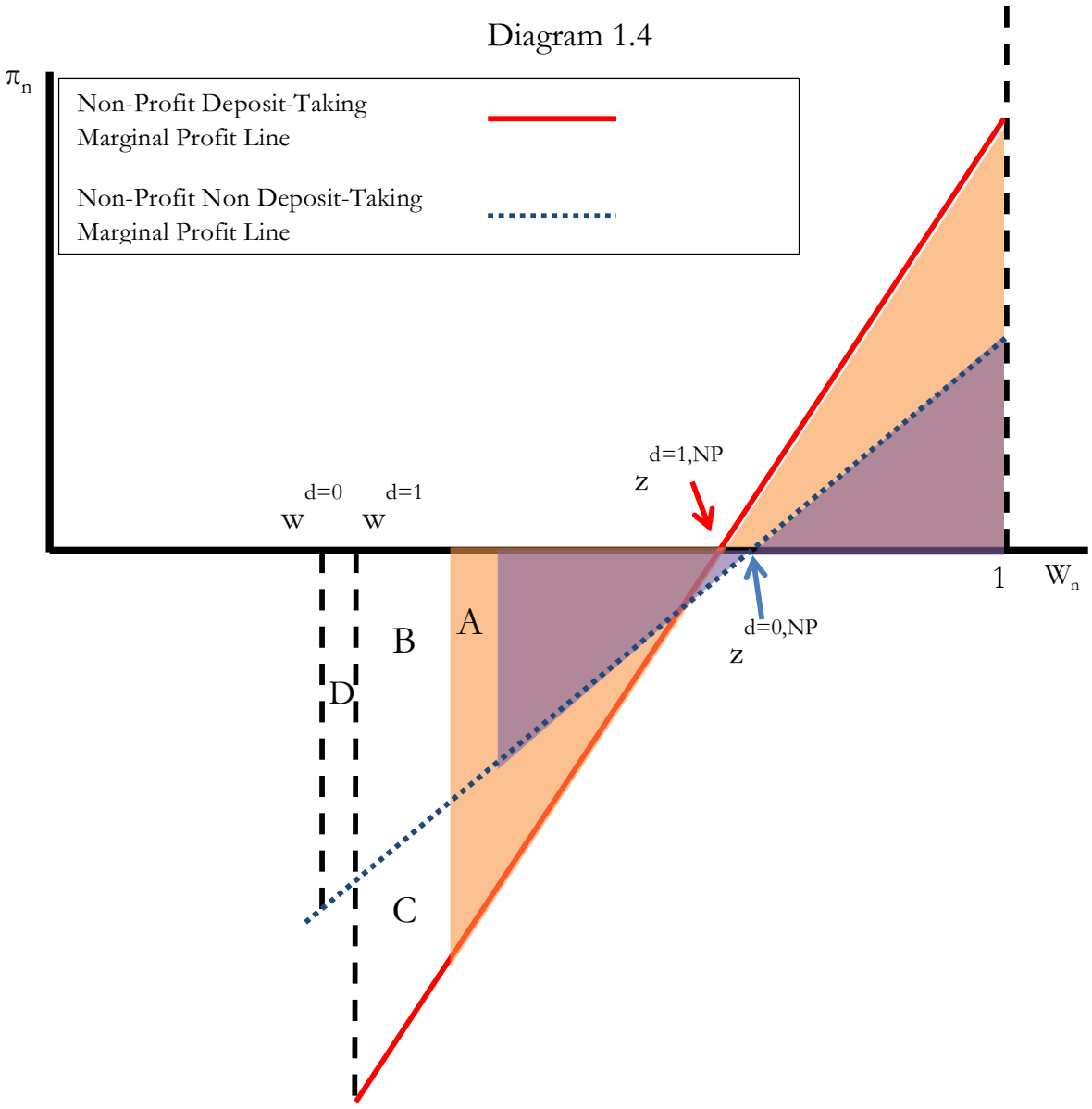


Diagram 1.4


π_n
Non-Profit Deposit-Taking Marginal Profit Line
Non-Profit Non Deposit-Taking Marginal Profit Line
d=1,NP
z
d=0
d=1
w
w
1
W_n
d=0,NP
z
A
B
C
D

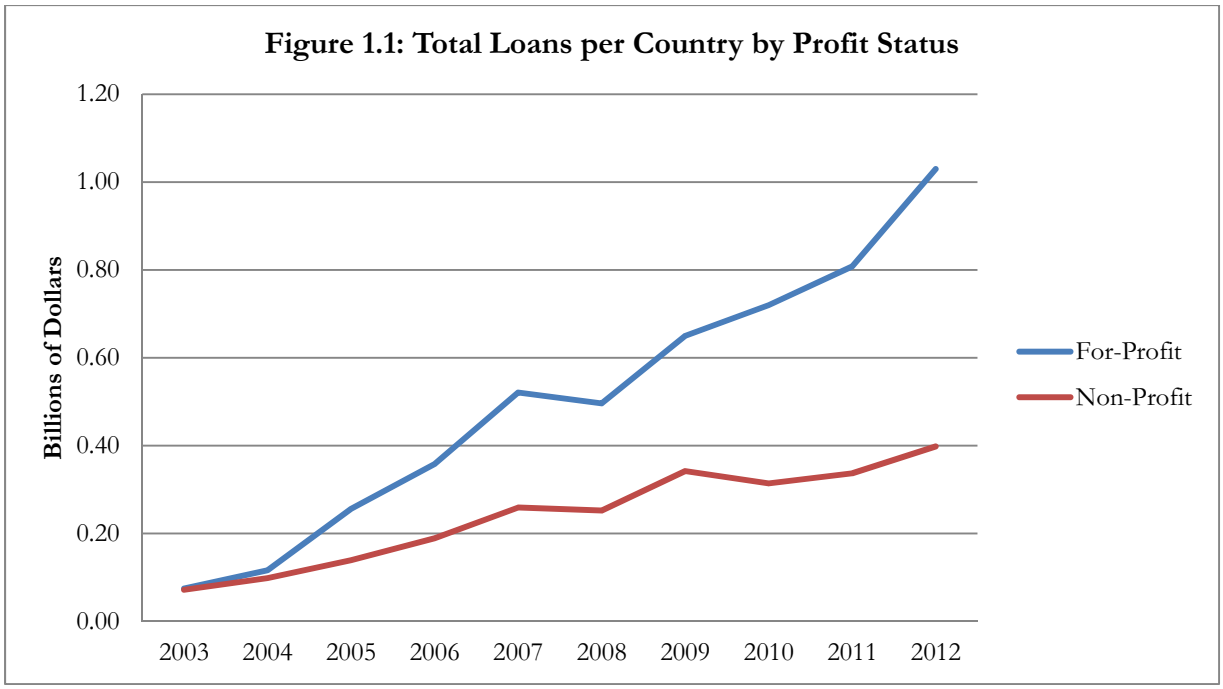


Figure 1.1: Total Loans per Country by Profit Status
Billions of Dollars
1.20
1.00
0.80
0.60
0.40
0.20
0.00
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
For-Profit
Non-Profit

Table 1.1: Description of Model Variables			
Symbol	*Description*	*Operationalization*	*Numerical*
N	The number of potential borrowers in the market.	$n = 1, \dots, N$	
w_n	The measure of wealth of the n^{th} borrower.	$w_n \in [0,1]$	
r_n	The interest rate of the loan to the n^{th} borrower.		
V_n	The size of the loan to the n^{th} borrower.		
p_n	The probability of the n^{th} borrower repaying his loan.	$p_n = \rho_0 - \rho_1 V_n(1 + r_n) + \rho_2 w_n$, where $\rho_1 > 0, \rho_2 > 0$	$\rho_0 = .5$ $\rho_2 = .0005$ $\rho_2 = .5$
β_R	The rate of return in the good state, when the borrower can repay the loan.	$\beta_R \geq 1 + r_n$	$\beta_R = 1.5$
β_B	The rate of return in the bad state, when the borrower cannot repay the loan.	$\beta_B \leq 1 + r_n$	$\beta_B = 1$
S_n	The borrower's expected surplus.	$S_n = p_n(\beta_R - (1 + r_n))V_n$	
J	The number of firms.		
t	The type of the firm, where $t = 1$ indicates a for-profit.	$t = \{0,1\}$	
d	An indicator which evaluates to 1 if the firm accepts deposits.	$d = \{0,1\}$	
$\pi_n^{d,t}$	The marginal profit for a firm of type t and deposit-taking captured by d lending to borrower n.	$\pi_n^{d,t} = p_n(1 + r_n)V_n + (1 - p_n)\beta_B V_n - (1 + c)V_n - F$	
F	The fixed cost of making a loan.	$F = f_o + f_1 d + f_2 t + f_3 d * t$	$f_0 = 5, 15, 25$ $f_1 = 15, 20$ $f_2 = 5$ $f_3 = -10$
G	The share of financing from giving, for non-profit firms.	$G = M - \gamma\mu_j$	$M = .15$ $\gamma = .15$
B	The share of financing from equity.		
E	The share of financing from equity, for for-profit firms.		
D	The share of financing from deposits.	$D = \delta_1 + \delta_2\mu_j$	$\delta_1 = .5$ $\delta_2 = .5$
c	The marginal cost of making a loan.	$c = c_1 G + c_2 B + c_3 E + c_4 D$	$c_1 = 0$ $c_2 = .3$ $c_3 = .25$ $c_4 = .2$
μ_j	The average wealth of the borrowers served by firm j.	$\mu_j = \sum_{n=1}^{N_j} w_n$	
$[1, N_j]$	The set of borrowers served by firm j.		
N_j^*	The number of borrowers served by firm j.		
V_j	The total value of loans made by firm j.	$V_j = \sum_{n=1}^{N_j} V_n$	

Table 1.2: Monopoly For-Profit Non-Deposit Taking				
	Profit-Maximizing		*Client-Maximizing*	
	Lower Bound	*Profit*	*Lower Bound*	*Num. Borrowers*
F= 10	0.49	7.15	0.00	1.00
F=20	0.69	4.23	0.33	0.67
F=30	0.85	0.86	0.69	0.31
In the table above, I assume that the marginal cost of equity is 0.25. I then examine three scenarios of low, middle, and high fixed costs, at 10, 20, and 30, respectively. The firm will lend to all borrowers with wealth levels above the lower bound.				

Table 1.3: Monopoly For-Profit Deposit Taking				
	Profit-Maximizing		*Client-Maximizing*	
	Lower Bound	*Profit*	*Lower Bound*	*Num. Borrowers*
F= 10, +5	0.43	11.35	0.00	1.00
+10	0.52	8.31	0.00	1.00
F=20, +5	0.59	6.21	0.15	0.85
+10	0.67	4.49	0.32	0.68
F=30, +5	0.94	0.16	0.87	0.13
+10	1.00	0.00	1.00	0.00
In the table above, I assume that the marginal cost of equity is 0.25 and the marginal cost of deposits is 0.20. I then examine three scenarios of low, middle, and high fixed costs, at 10, 20, and 30, respectively. In addition, I examine whether accepting deposits has a small or large change to fixed costs, at an additional cost of 5 or 10. The share of deposits received is endogenized based on the average loan size. The firm will lend to all borrowers with wealth levels above the lower bound.				

Table 1.4: Monopoly Non-Profit Client-Maximizing				
	No deposits		*Deposits*	
	Lower Bound	*# Borrowers*	*Lower Bound*	*Num. Borrowers*
F= 5, +15	0.00	1.00	0.00	1.00
+20	0.00	1.00	0.00	1.00
F=15, +15	0.00	1.00	0.00	1.00
+20	0.00	1.00	0.00	1.00
F=25, +15	0.74	0.26	0.00	1.00
+20	0.74	0.26	0.24	0.76
In the table above, I assume that the marginal cost of debt for non-profits is 0.30 and the marginal cost of deposits is 0.20. Donations are assumed to have no marginal cost. I then examine three scenarios of low, middle, and high fixed costs, at 5, 15, and 25, respectively. In addition, I examine whether accepting deposits has a small or large change to fixed costs, at an additional cost of 15 or 20. The share of donations and the share of deposits received are endogenized based on the average loan size. I examine the firm outcome if it lends to all borrowers with wealth levels above the lower bound, although this is not necessarily the optimizing choice for the non-profit.				

Table 1.5: Duopoly Profit-Maximizing For-Profit				
	Neither takes deposits		*Both take deposits*	
	Lower Bound	*Profit*	*Lower Bound*	*Profit*
F= 10, +5	0.78	0.52	0.67	1.49
+10	0.78	0.53	0.76	0.83
F=20, +5	0.99	0.01	0.84	0.37
+10	0.99	0.01	0.92	0.10
F=30, +5	1.00	0.00	0.99	0.003
+10	1.00	0.00	1.00	0.00
In the table above, I assume that the marginal cost of equity is 0.25 and the marginal cost of deposits is 0.20. Interest rates charged are assumed to follow the form: 1.3 + .2/J, where J is the number of firms. I then examine three scenarios of low, middle, and high fixed costs, at 10, 20, and 30, respectively. In addition, I examine whether accepting deposits has a small or large change to fixed costs, at an additional cost of 5 or 10. The share of deposits received is endogenized based on the average loan size. The firm will lend to all borrowers with wealth levels above the lower bound.				

Table 1.6: Duopoly Client-Maximizing Non-Profit				
	Neither takes deposits		*Both take Deposits*	
	Lower Bound	*# Borrowers*	*Lower Bound*	*# Borrowers*
F= 5, +15	0.00	0.50	0.15	0.43
+20	0.00	0.50	0.47	0.27
F=15, +15	1.00	0.00	0.74	0.13
+20	1.00	0.00	0.97	0.02
F=25, +15	1.00	0.00	1.00	0.00
+20	1.00	0.00	1.00	0.00
In the table above, I assume that the marginal cost of debt for non-profits is 0.30 and the marginal cost of deposits is 0.20. Donations are assumed to have no marginal cost. I then examine three scenarios of low, middle, and high fixed costs, at 5, 15, and 25, respectively. In addition, I examine whether accepting deposits has a small or large change to fixed costs, at an additional cost of 15 or 25. The share of donations and the share of deposits received are endogenized based on the average loan size. Interest rates charged are assumed to follow the form: 1.3 + .2/J, where J is the number of firms. I examine the firm outcome if it lends to all borrowers with wealth levels above the lower bound, although this is not necessarily the optimizing choice for the non-profit.				

Table 1.7: Summary Statistics by Profit Status

Variable	***Non-Profit***	***For-Profit***
Key Variables		
Average Loan Balance per Borrower	1227.99	1395.18
Yield on Gross Portfolio Real	0.26	0.37
Gross Loan Portfolio (millions)	25.20	91.00
Deposits Indicator	0.32	0.45
Financing Variables		
Assets (millions)	32.50	115.00
Equity (millions)	6.55	17.70
Deposits (millions)	16.70	57.50
Debt to Equity	3.45	9.86
Deposits to Assets	0.18	0.21
Performance Variables		
Return on Assets	0.00	0.01
Financial Expenses over Assets	0.05	0.06
Operating Expenses over Gross Loan Portfolio	0.32	0.36
Cost per Borrower	214.97	289.39
Borrowers per Staff Member	124.92	141.81
Portfolio at Risk - 30 Days	0.08	0.07
Administrative Expenses over Assets	0.09	0.10
Operational Self-Sufficiency	1.13	1.15
Total Expenses over Assets	0.29	0.34
Size Variables		
Personnel	129.62	533.47
Number of Active Borrowers (thousands)	17.55	71.76
Number of Depositors (thousands)	22.62	69.95
Offices	12.85	34.06
Other Variables		
Percent of Female Borrowers	0.63	0.63
Average Salary over GNI	3.54	4.15
Observations	2007	1179

Table 1.8: Correlation Table by Profit Status

Non-Profit Organizations: n = 2007

	Avg. Loan	Yield	Portfolio	Deps. Indicator
Average Loan Balance per Borrower	1			
Yield on Gross Portfolio Real	-0.4316*	1		
Gross Loan Portfolio (millions)	0.2907*	-0.1398*	1	
Deposits Indicator	0.3446*	-0.2767*	0.2713*	1
% For-Profit	-0.1452*	0.1261*	-0.0135	-0.0296

For-Profit Organizations: n = 1179

	Avg. Loan	Yield	Portfolio	Deps. Indicator
Average Loan Balance per Borrower	1			
Yield on Gross Portfolio Real	-0.4252*	1		
Gross Loan Portfolio (millions)	0.3081*	-0.1738*	1	
Deposits Indicator	0.2460*	-0.2187*	0.2495*	1
% For-Profit	0.0953*	0.0172	0.0654*	0.1629*

Table 1.9: Segmentation of Average Loan Balance by Profit Status

	Model 1	Model 2	Model 3
For-Profit Indicator	139.53***	519.37***	538.69***
	(54.00)	(56.75)	(57.33)
Constant	674.58***	-198.41	71.58
	(117.52)	(171.28)	(674.96)
Fixed-Effects	Year	Year, Country	Year#Country
Observations	3186	3186	3186
R-squared	0.047	0.203	0.245

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 1.10: Relationship between For-Profit Share and Loan Balance, Deposit-Taking

	Model 1 Loan Balance	Model 2 Loan Balance	Model 3 Deposits Indicator	Model 4 Deposits Indicator
For-Profit Indicator	-501.06***	-824.17***	-0.17***	-0.42***
	(169.97)	(184.04)	(0.05)	(0.06)
% For-Profit	-791.36***	-1997.13***	-0.06	-0.55***
	(122.77)	(243.05)	(0.04)	(0.08)
For-Profit*%For-Profit	1065.28***	2046.83***	0.43***	0.84***
	(242.26)	(264.00)	(0.08)	(0.09)
Constant	1113.65***	1275.72***	0.14***	0.18**
	(134.83)	(250.11)	(0.04)	(0.08)
	Year	Year, Country	Year	Year, Country
Observations	3186	3186	3186	3186
R-squared	0.059	0.223	0.042	0.183

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Table 1.11: Segmentation of Average Loan Balance by Deposit-Taking

	Model 1	Model 2	Model 3
For-Profit Indicator	82.24	520.82***	539.67***
	(66.99)	(68.28)	(69.19)
Deposits Indicator	954.67***	1021.59***	1011.94***
	(68.01)	(67.20)	(69.00)
For-Profit*Deposits	-132.44	-305.04***	-295.67***
	(106.67)	(104.09)	(105.85)
Constant	568.39***	-48.3	71.33
	(113.01)	(164.58)	(644.76)
Fixed-Effects	Year	Year, Country	Year#Country
Observations	3186	3186	3186
R-squared	0.128	0.275	0.312

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Chapter 2

The Effect of Synergies and Competition on Organizational Choices in Non-Profits: Evidence from Latin American Microfinance

ABSTRACT

Whether non-profit organizations should use business tools traditionally associated with the for-profit sector has been a widely debated issue. The push to encourage non-profits to adopt commercial tools has been particularly strong in microfinance, given the co-existence of non-profit institutions with firms that are more commercially oriented, such as for-profit banks and specialized microfinance banks. One such commercial tool is the use of commercial funding, including deposits, which is arguably increasingly useful given declining donations. I find that non-profits frequently do not benefit from the adoption of deposit-taking, and in fact many suffer declines in their financial performance after such adoption. However, those non-profits that make larger loans, thereby more closely mirroring the loan-making behavior of for-profit organizations, improve their financial performance after the adoption of deposit-taking. This result suggests that complementarities between commercial financing and borrower targeting are important, and such synergies are relevant when considering non-profit adoption of for-profit business tools. The extent of financial benefit is moderated by the amount of for-profit competition in the country, suggesting competitive concerns constrain whether these complementarities are worth pursuing.

Keywords: *non-profit strategy; competition; microfinance*

1 Introduction

"What was being said back then was that when you talk about financial services to poor people, there is room for a range of institutions. The reality is that the non-profit will be limited in its scale. It's going to be pulled into commercializing, and potential regulation, and having a new set of stake-holders, which are beyond simply the clients and donors. Just by adding those additional stake-holders, the way you make decisions has to change." (Source 2: CEO of a Microfinance Institution in Latin America)

The literature examining process and product adoption often focuses on determinants of the rate of technology diffusion in nascent industries, such as in disk drives (Suarez & Utterback, 1995; Utterback, 1996). However, more recent literature has taken a closer look at the decision of whether or not to adopt based on organizational (Helfat & Lieberman, 2002) or environmental characteristics (Kapoor & Furr, 2015), motivated largely by the complementary assets framework (Teece, 1986). For example, this lens has been used to examine how differences in capabilities between diversifying firms and start-ups influence performance in a new industry (Ganco & Agarwal, 2009; Helfat & Lieberman, 2002; Khessina & Carroll, 2008; Klepper, 2002).

This paper picks up on that stream of literature by considering the choice of entities (such as non-profit microfinance firms) as to whether to make an adoption (e.g., of commercial tools) where the adoption's advantages are not overwhelmingly clear, even if the new practice or product seems to have some apparent benefits. Therefore, evaluating the fit between the organization and the new product or process is important in analyzing and predicting both whether (and when) the tool is adopted and the effects of adoption (Zott & Amit, 2008). Further, this evaluative approach can be applied beyond choices regarding technology adoption to adoption of other practices and procedures (Qian *et al.*, 2013).

I utilize the co-existence of for-profit and non-profit organizations in microfinance, as well as the fairly recent developments that have encouraged some of these organizations to adopt commercial tools, in Latin America to explore the question of fit between the organization and the adoption

of a business practice. The adoption I focus on is the use of commercial funding, particularly of deposits. Both donors and other stakeholders have frequently encouraged that adoption to offset the effects of declining donations. Through examining the heterogeneous effects of this adoption based on the particular characteristics of the organization, my paper also addresses the debate about why heterogeneity continues to exist in business practices (Christmann, 2000).

The static differences between non-profits and for-profits support the notion that there is a preferred or appropriate fit between product market strategy and business model. However, there are also substantial variations in strategy among non-profit entities (e.g., Beard & Dess, 1981; Brooks, 2005; and many others). In this paper, I will, therefore, also look within the non-profit sector to understand variation in ability to adopt (or interest in adopting) commercial financing.

I find heterogeneity in the effects of this change in the source of financing on financial performance based on whether or not the firm had a contemporaneous change in targeted borrowers. This suggests that complementarities between adoption and product strategy are important in the non-profit sector. However, the positive effects of complementarities are moderated by the amount of competition, particularly competition with for-profit entities. These results are important in understanding the future of an increasing number of industries where distinct business models now co-exist, as for-profits and non-profits overlap in more industries (Ben-Ner, 2002; Dees & Anderson, 2003), and in enhancing our understanding of business model competition (Casadesus-Masanell & Ricart, 2007).

The microfinance industry provides a good setting to study the different business models of non-profits as compared to for-profits, as well as changes in these models. Firms in this industry traditionally served marginalized populations using an alternative model to that of the commercial banking sector (Mersland & Strom, 2010). Further, this industry was largely populated by non-profit organizations in its nascent stages, but has since had entry by for-profit firms and conversion of some non-profit to for-profit organizations (Battilana & Dorado, 2010; Hermes *et al.*, 2011). And, a few well-publicized conversions of non-profit to for-profit organizations, in the 1990s, led to the life cycle theory of microfinance, whereby non-profit organizations would become more

commercial as they age (de Sousa-Shields, 2004; Helms, 2006). While there is some support for this hypothesis (Farrington & Abrams, 2002), there is substantial heterogeneity in the extent to which this transition has occurred. Bogan (2012) finds that it is not the age of the microfinance institution (MFI), but rather the sources of its funding and its size that better predict financial performance.[1]

One of my paper's contributions arises from its analysis of the interplay between the use of commercial sources of funding and the appropriate business model. The effect of commercial funding may differ by profit status and by the characteristics of the targeted borrowers. Bogan (2012) and Ly and Mason (2011) suggest that non-profits in the microfinance industry are less profitable and effective insofar as they spend energy competing for scarce donations. However, my paper suggests that non-profits may be limited in the extent to which they can compete like for-profits, both in that adopting commercial funding may require them to make a product market change and because their financial success is still limited by for-profit competition.

The effect of deposit-taking for non-profit institutions may be contingent on making simultaneous changes in the business model and in other organizational changes. In particular, I look at changes in a firm's average loan size, as loan size is a common proxy for the wealth of the borrower served (e.g., Mersland & Strom, 2010; Cull *et al.*, 2011). I find that non-profit microfinance institutions that scaled up their loan size over this period benefited from beginning to accept deposits in terms of improved operating self-sustainability and return on assets. In contrast, those that accepted deposits but did not significantly increase their average loan size experienced deterioration in these financial measures. Further, while non-profits may have goals beyond financial performance, I find that those deposit-taking non-profits that did not upscale their targeted borrowers did not perform better in terms of other objectives (such as the number of borrowers reached) than did comparable non-deposit taking non-profits.

[1] Financial performance here is defined by operational self-sufficiency, a measure capturing the extent to which the firm can continue to finance its loan operations from its revenue. I also use this measure and further describe it in Section 3.

The rest of this section will provide the context for my analysis by examining the interaction between non-profits and for-profits, particularly in the microfinance industry. Section 2 develops my hypotheses regarding the effects of the adoption of deposit accepting, motivated by the literature and industry context. Section 3 describes the data and presents the empirical analyses and Section 4 concludes, describing limitations and suggesting future research.

1.1 Context of Non-profits and Microfinance

Non-profit firms are increasingly using business tools associated with the for-profit sector, such as more detailed business planning and analytics, and performance-based human resource systems (Eisenberg, 1997; Erus & Weisbrod, 2003). This movement has come as a result of increasingly tight donor funds, which force non-profit organizations to operate with increasing financial returns or under stricter financial constraints (Rhyne & Otero, 2006).[2] However, the adoption of such analytical and finance-focused systems is not trivial in non-profit organizations. There are many instances where generating higher returns may be at odds with the mission of the organization (McIntosh & Wydick, 2005). Further, at least in the short run, such investments in the administration of the organization would divert resources from the population in need, which can affect future donations (Bowman, 2006).

The distinct approaches and tools used by for-profit and non-profit organizations have been examined in the healthcare and education sectors, largely in the U.S. There are numerous conflicting findings from the healthcare setting, including regarding whether non-profit organizations operate with a distinct objective, such as to maximize their own output (Horwitz & Nichols, 2009), or to maximize management perquisites (Chang & Jacobson, 2010). However, Duggan (2000) concludes that health care non-profits do not respond differently than for-profits to incentives provided by government programs, and thus he does not find evidence which supports differences in objectives by profit status. On the other hand, for-profits have been found to respond better to increasing demand in terms of a better ability to increase capacity (Hansmann, 1987). My paper explores some of the issues brought up in this literature by exploring the effects of changing sources of financing

[2] This decline in donations is partly due to increasing competition with other non-profit organizations, as well as a decline in the amount of total available donations due to other external economic factors.

in determining outcomes, and addresses the hypothesis that as competition increases, differences by ownership type should decline (Sloan, 2000).

The business models of microfinance organizations are distinct in that for-profits tend to have substantial administrative overhead, reflecting formal processes and pressure from external stakeholders and regulators, and focus on making larger loans to wealthier borrowers in more urban areas, where such formal processes attract clients and are cost effective. In addition, these organizations generally have more debt relative to equity capital and are, therefore, more highly leveraged. On the other hand, non-profits have less formalized systems and focus on group lending,[3] female borrowers, and rural areas. Thus they make smaller loans and depend more on interpersonal connections.

Initially, deposit-taking was quite rare in Latin American microfinance as microlending was the key focus (Kiviat, 2009). However, the taking of deposits is a key element of commercial banking since deposits are the "principal source of an individual bank's power to lend and invest" (Hodgman, 1961). Deposit-taking by MFI entities is becoming increasingly common and encouraged as commercial banks enter into microfinance and existing MFIs explore commercial sources of finance (Farrington & Abrams, 2002). Such deposit-taking by non-profits represents a shift in the non-profit MFI business model.

The ability in terms of the firms' existing infrastructure to take deposits is quite different between these business models. In particular, "NGOs lack the governance, legal status, and institutional capacity to intermediate voluntary deposits from the public" (CGAP, 2005). Thus, deposit-taking provides an appropriate activity to examine whether non-profits can, or would want to, effectively utilize a business practice associated with the commercial, formalized for-profit business model.

[3] Group lending is where money is dispersed to a group, rather than to an individual. Peer pressure is used to induce loan repayment and the group's knowledge of each other is used to determine the allocation of the group's loan to individual members within the group.

My sample period includes the years of the global financial crisis. During the crisis years, the ability of an organization to self-finance growth became increasingly important as the availability of donations (to non-profits) and equity was declining.[4] Industry reports describe how firms that relied on deposits during the financial crisis generally fared better because deposits in this period provided a relatively available way to support the organization, even amid declining external financing and worsening loan performance (Lutzenkirchen *et al.,* 2012).[5] As explained below, the financial crisis may have shifted the relative attractiveness of initiating deposit-taking, and thus my sample includes a particularly interesting and relevant time period.

Accepting deposits importantly changes a firm's business model in a number of ways. First, it changes the relationship and flexibility of the organization to choose its borrowers. For example, in one of my interviews, the CEO of a microfinance institution in Latin America that recently began accepting deposits said, "when you're an NGO and you're a non-profit, you can choose who your clients are. Once you take deposits, your clients choose you and you become reliant on them, because you are using their deposits to fund lending. So they are dictating what you can and cannot do" (Source 2). This partly reflects that a depositor expects - although may not get - special attention to his borrowing needs. This important change in the nature of a stakeholder relationship indicates a disruption in the business model, as there are different constraints on the nature and process of doing business. Second, accepting deposits generally means becoming more closely regulated. For instance, this same CEO said, "as a deposit-taking institution, I have to [keep] sufficient capital. [Accepting deposits] generally goes along with accepting the same regulation as for-profits" (Source 2).[6] These effects should be particularly strong for non-profit institutions, as they are less likely to have satisfied regulatory requirements prior to accepting deposits and more likely to have relied on social and relational lending prior to the change.

[4] See Table 1 in Bogan (2012) for a description of the different sources of funding commonly used by MFIs.

[5] Because there was much unmet demand for deposits at this time, by available I mean easy to access or expand this source of MFI funding.

[6] By capital, the CEO is referring to the sum of debt and equity, or the amount of reserves available with which to pay back depositors.

While in the early years of microfinance there were only weak ties with global and country level macroeconomic conditions (Krauss & Walter, 2009; Gonzalez, 2007), by the time the global financial crisis of 2007-2008 hit, ties with broader financial conditions appeared more relevant (Di Bella, 2011). Thus, microfinance in Latin America was affected by the financial crisis both through the decrease in donations (Wagner & Winkler, 2013) and the increase in default rates among borrowers (Chen *et al.,* 2010). However, microfinance institutions, in terms of both deposits and loans, had important elements of stability during this crisis, as was also seen in a previous crisis (Patten & Johnston, 2001). In particular, low income depositors provided a stable source of funding during the period (Lutzenkirchen *et al.*, 2012). While banks, including commercial banks in the US, faced major lending (including to sub-prime mortgage borrowers) and interbank obligation difficulties, as well as problems with their reputation and legitimacy (Chatterji *et al.,* 2015), these challenges should be less of an issue in microfinance.

The relatively stable performance of deposits as a source of funding during the crisis, as compared to donations, means that I expect deposit-taking to have had an even greater relative benefit for non-profits in my sample period. Hence, a finding that some entities initiating deposit-taking in the period had reduced performance would be particularly striking.

2 Hypotheses Development

Following the logic of Le Breton-Miller & Miller (2015), I view the adoption of deposit taking as the choice of a potentially valuable new practice for the MFI entity, but one that is not without trade-offs for it. I view this choice on three levels. First, there are costs associated with the changes required by the organization to accept deposits as well as the benefit of additional financing. In particular, organizations that begin accepting deposits may face additional regulation and will have to add administrative and organizational support for the new form of revenue. The Consultative Group to Assist the Poor states that "mobilizing deposits...requires strong accountable governance, sound asset management, and an enabling legal and regulatory environment" (CGAP, 2005). Thus, I expect that deposit-taking will be associated with an increase in administrative costs. On the other hand, interest rates paid out on deposits were quite low and potential depositors were widely

available (Lutzenkirchen *et al.,* 2012). Thus deposit-taking should also be associated with a lower interest expense percentage:

Hypotheses 1a: Adopting deposits increases administrative costs and lowers the interest expense percentage paid on liabilities.

While this effect will exist for all institutions, initiating deposit-taking requires non-profits to make relatively greater changes to their organizational structure than do for-profit organizations. As a result, this increase in administrative costs will be higher in non-profit organizations. However, because non-profits have relatively more limited access to external funding (Kistruck *et al.,* 2013), the benefits of taking deposits in terms of lowering the costs paid on liabilities (and possibly increasing the feasible growth rate of the entity) will also be greater for non-profit organizations:

Hypotheses 1b: Both effects will be larger in non-profit MFIs relative to for-profit organizations.

The effects of deposit-taking will differ depending on other characteristics of the organizations. On one hand, a lack of fit between deposit-taking and the current activity system and capabilities of the MFI may result in worse performance (Rivkin, 2000; Siggelkow, 2002). On the other hand, the adoption of deposit-taking could lead to positive performance benefits due to business model innovation (Gavetti *et al.,* 2005; Gambardella & McGahan, 2010). Because many of the depositors will also become borrowers (and vice versa), I focus on the relationship between beginning to accept deposits and transitioning to a different borrower segment.

As implied by the CGAP quote above, deposit-taking institutions will have higher fixed costs but lower marginal costs of lending, as they now have access to a large source of financing (deposits) but have overall higher administrative costs. As a result, I expect that organizations that make larger loans, to wealthier borrowers, will have better financial performance effects from accepting deposits due to this cost structure. The additional costs that are undertaken as a result of deposit-taking will lead to higher financial returns if the organization uses these funds to scale up its typical

loan size:[7]

Hypothesis 2a: The effect of deposit-taking on financial performance will be more positive in MFIs that begin making larger loans as compared to those that do not.

In addition to the synergy due to changes in the cost structure, stakeholders may find that organizations that scale up loan size as well as initiate deposit taking are more consistent as they are adopting congruent business model and product market strategy changes and are providing a clear message regarding how the organization is changing. I expect this effect to occur in both for-profits and non-profits. However the effect should be more pronounced in non-profit organizations as the changes required in the organizational structure are greater. In addition, a more cohesive change may be more important for non-profit organizations as the importance of external stakeholders, particularly existing and potential donors, is higher (Ridder & McCandless, 2010). In particular, when a non-profit begins taking deposits it may be seen (by donors and other stakeholders) as a partial shift away from its mission; it is important that the organization commits to a change as opposed to getting stuck in the middle between two battling organizational logics (Battilana & Dorado, 2010). Thus, I expect the following to hold:

Hypothesis 2b: The complementarity between the adoption of deposit-taking and an increase in average loan size will be stronger in non-profit than in for-profit organizations.

However, I also expect that this result might be moderated by the external conditions of the market. In particular, two opposing forces influence the effect of this complementarity in non-profit organizations. On one hand, to the extent that the for-profit microfinance business model is considered legitimate (Suchman, 1995; Abrahamson 1991), non-profit organizations that scale up

[7] The logic underlying changes in lending behavior, as well as in financial performance, after accepting deposits can be explained further as follows. MFI entities (particularly non-profits) may view their mission as bringing as many people into the financial system as is consistent with financial viability for the entity. This "mission" will be associated with relatively low average loan sizes. Access to a new, lower incremental cost source of funding will permit higher average loan size and continuing to serve the "mission." However, unless the average loan sizes rises significantly, the higher administrative costs cannot be covered. And the adoption of deposit-taking by such an entity would be a failure absent sufficient increase in loan size to offset such costs. (Of course, certain geographies may not permit the requisite increase in average loan size due to poverty, competition, etc.)

to larger loan sizes and begin accepting deposits may benefit from such legitimacy, or from being seen as operating with increased "efficiency". On the other hand, non-profits pursuing similar borrowers and offering similar products to those of for-profit firms may sacrifice their differentiation (Deephouse, 1999). Thus, these opposing forces can be considered to moderate the benefits from increasing loan size and beginning to accept deposits by non-profit organizations:

Hypothesis 3: The positive benefits to moving to larger loan sizes and deposit-taking for non-profit MFIs will be moderated by competition with for-profit MFIs.

Alternative Hypothesis 3: The positive benefits to moving to larger loan sizes and deposit-taking for non-profit MFIs will be magnified by the legitimacy of for-profit MFIs.

3 Empirical Analysis

3.1 Data

In order to test the above propositions, I use two sources of data. The first is the financial and organizational information on microfinance institutions at the firm-year level. This comes from the MIX Market Data, which is a publicly available annual dataset that incorporates information that microfinance firms file voluntarily.[8] Due to this self-selection, the firms in this sample tend to be the larger and more financially transparent MFI firms. However, because most microfinance loans are made by the top firms in each country, I still capture a large percentage of the industry activity (Cull *et al.*, 2011; Bogan, 2012).

The current sample used in this paper runs from 2003 through 2012. It also uses only data from Latin America, as there are substantial regional differences in the development of microfinance (Ahlin *et al.,* 2011). Latin America was chosen as microfinance tends to be the farthest developed and the introduction of deposit-taking in that region largely occurred in my sample years, thus allowing me to capture the effects of this organizational decision.

[8] This data can be accessed through the MIX Market portal, by selecting to download the Basic MIX MFI Data Set: http://www.mixmarket.org/profiles-reports.

Table 2.4 contains a breakdown of the number of firms by country. The full sample contains 522 firms, but firms are in the sample for a wide variety of years as can be seen in Table 2.5. Because the focus of my paper is on the performance over time of deposit-taking compared to non-deposit-taking institutions, I purposefully selected those firms with at least 8 years of MIX data, resulting in a sample of 213 firms. I supplement the publicly available MIX Market Data with purchased data which breaks down the type of deposits. This is important as compulsory deposits differ from other deposits, in that they are used as collateral for loans as opposed to a source of financing for the firms. Finally, I supplement this data with country data from the World Bank's World Development Indicators (WDI) to provide context about country conditions.[9]

INSERT Table 2.4

INSERT Table 2.5

3.1.1 Dependent Variables

The dependent variables I focus on are firm-year level performance measures, as I want to examine the effect of deposit-taking on firm performance. I focus on three variables provided by MIX Market: operational self-sufficiency, return on assets, and profit margin. These variables have been used in prior studies of microfinance using MIX Market data and thus I examine each of them to foster comparisons with the prior literature.

Operational Self-Sufficiency is defined as Financial Revenue over the sum of Financial Expense, Impairment Loss, and Operating Expense.[10] This is an important measure for microfinance institutions as it captures the extent to which the organizations can fund their own operations (and growth) from the revenues on their loans. While non-profits may also rely on donations for growth,

[9] This data is publicly available and can be downloaded from the World Bank's website: http://data.worldbank.org/data-catalog/world-development-indicators.

[10] A value greater than one implies the firm can grow or add to its capital over time (or, for for-profits, pay dividends) whereas a value less than one implies the firm is making losses.

the decline in donations means that even those more mission-oriented organizations are increasingly focused on this measure. In fact, donations are frequently ear-marked solely for start-up costs or new innovations (Armendriz de Aghion & Morduch, 2004) and thus the majority of the gross loan portfolio is expected to be self-sustaining. This variable is commonly used to analyze the financial performance of organizations in this industry (e.g., Bogan, 2012).

Return on Assets is defined as the net operating income, less taxes, over assets. Net operating income is defined as Financial Revenue less the sum of Financial Expense, Impairment Loss, and Operating Expense. This variable was used in Cull *et al.,* (2011) and captures the extent that the firm is able to generate net revenue from its assets.

Profit Margin is defined as the net operating income over financial revenue. While somewhat less used in the microfinance literature, profit margin captures to what extent the organization earns profit from its revenue-generating activities. Even though non-profit organizations do not distribute their "profit", this measure still captures the ability of the firm to generate funds for its maintenance and expansion.

3.1.2 Independent Variables

In the initial set of analyses, I look at the effects of initiating deposit-taking and thus the key variable to capture is when a firm begins accepting deposits. However, I am also interested in how this interacts with product market strategy. Finally, I am interested in how the product market strategy relates to competition with for-profit peers in the country. Thus I define the following variables of interest:

After Deposits is an indicator variable which evaluates to one for years after the organization first takes deposits. Since I use models with fixed effects at the firm level, this variable will capture the effects of initiating taking deposits by a given firm.[11] Table 2.6 shows the number of for-profits

[11] There are only a couple of instances where a firm seems to stop taking deposits. The results are robust to not including these firms. Further investigation would be necessary to verify whether these firms did indeed stop taking deposits, and if so, to understand what happened in these instances.

and non-profits that added deposit-taking during the sample period. It shows a sizeable sample of organizations in each of the groups. In particular, there are 59 non-profits that added deposit-taking and 79 that did not.

INSERT Table 2.6

Small to Big - After Deposits is the interaction of the After Deposits variable with an indicator which is defined as one for organizations that began the sample period with an average loan size that is less than $\$1,000$ and ended it with an average loan size that is more than $\$1,000$. For instance, a firm will have a value of one for this variable if its average loan size was less than $\$1,000$ in 2003 and more than $\$1,000$ by 2012, although only for those years after when the firm began accepting deposits.[12] Since average loan balance is a common proxy for the wealth of the borrowers being targeted (Cull *et al.,* 2011), this variable captures organizations that are likely to be scaling up to reach more prosperous borrowers.

Table 2.7 shows the number of for-profits and non-profits that are classified as going through this scaling up process, and thus I again have a sizeable sample of organizations in each category, with 37 non-profits that scale up. In addition, 18 of these 37 also added deposit-taking, as seen in Table 2.8, and thus there are organizations in each desired category. More generally, Table 2.7 shows that a higher proportion of for-profits than non-profits scaled their average loan size up to above $1000 (39% versus 27% in Table 2.7), added deposit-taking (65% versus 43% in Table 2.6), and scaled up loans of those adding deposits (39% versus 30.5% in Table 2.8).

INSERT Table 2.7

INSERT Table 2.8

[12] This dollar threshold was suggested by my industry contacts as a useful cut-off point. However, I investigated the robustness of the results to use of alternative criteria, including cut-offs based on the level and percentage changes in the loan size over the period, and changes in loan size relative to the industry average. The results do not change substantially using these alternatives.

Percent For-Profit is a continuous variable which is defined as the ratio of the gross loan portfolio of all for-profit MFIs in a given country and year over the total gross loan portfolio of all MFIs in that country and year, where these loan amounts are defined from MIX Market. It captures the extent to which peer firms in the country and year are for-profits.

Penetration is a continuous variable which is the ratio of the total number of borrowers of all MFIs in a given country and year over the poor population in the country, where the poor population is defined as those living below $3.10 a day.[13] I checked the robustness of this measure with that provided in the online data appendix by the authors of the Martinez and Krauss (2015) paper, and originally developed by Krauss *et al.,* (2012).[14]

3.1.3 Firm Controls

I include a number of controls at the firm level. First, while I use the decision to begin accepting deposits as the key variable of interest, I also add controls for the extent to which the firm utilizes deposits and the "type" (compulsory or not) of deposits being used. Specifically, I employ the following variables: *Deposits to Assets*, the ratio of total deposits to total assets, and *Compulsory Deposits Only*, which evaluates to one for firms that only accept compulsory deposits, as such deposits provide collateral as opposed to a primary source of MFI funding. I expect that firms that only accept compulsory deposits will have different outcomes, given that the organizational requirements and reasons for taking deposits are different for these firms.

In addition, I want to control for the size of the organization and the average loan size, as there may be scale effects with regards to both of these measures. *Number of Borrowers* captures the total number of borrowers that a firm makes loans to in a given year. This variable captures the effect of organizational scale. *Average Loan Balance* is the average loan balance carried by a borrower in the firm and year. Because larger loans are often thought to be more cost efficient (in terms of loan administrative costs), this variable is a key control in evaluating the effects of

[13] The data on the number of borrowers comes from MIX Market and the data on the poor population in the country comes from the World Development Indicators (WDI).

[14] The data can be accessed and downloaded by the public: http://www.cmf.uzh.ch/penetrationdata.html.

deposit-taking.

3.1.4 Country Controls

In terms of the country controls, I first want to control for characteristics that capture the state of microfinance in the country. *Sum of Gross Loan Portfolio* is the total gross loan portfolio of all MFIs in a given country and year, measured in US Dollars. I also include as controls the two measures of competition mentioned above, *Percent of Loans made by For-profits* and *Borrowers as a percentage of the poor population.*

In addition, I want to control for demographic and macroeconomic conditions which can influence the performance of microfinance institutions in a given country and year. *Unemployment, Urban, and Female percent of the population* capture demographic characteristics of the population: the percentage of the population that is unemployed, the percentage that lives in urban environments, and the percentage that is female. *Inflation rate, GDP growth, and Foreign Direct Investment (FDI)* capture the changing health of the country in a macroeconomic sense. These variables are defined as the annual inflation rate, the annual growth rate of GDP, and the net inflow of foreign direct investment in US dollars.

3.2 Descriptive Statistics

Figure 2.1 shows that, over the sample of ten years, the industry as a whole is growing in terms of the total loan amount across all firms. In addition, the increased commercialization in the industry is also reflected in my data, as captured by the increasing share of loans being made by for-profit institutions.

INSERT Figure 2.1

In addition, Figure 2.2 shows the growth of deposit-taking by both for-profit and non-profits organizations.

INSERT Figure 2.2

In Table 2.2, I provide basic summary statistics of a subsample of the variables in my full sample, breaking out the sample by profit status, in order to illustrate the different models generally pursued by for-profits and non-profits. In addition, I provide the T-test values for differences in the pooled sample as well as the T-statistics from a regression of the variable on the non-profit dummy, with country-year fixed effects. In other words, the T-test examines if the means provided are different whereas the T-statistic considers whether non-profits and for-profits have different values for these variables within a given country and year. I find that a number of relationships are consistent with what I would expect. First, non-profits are significantly smaller, in terms of assets, gross loan portfolio, number of active borrowers, and personnel. In addition, non-profits make smaller loans and target a higher percentage of female borrowers.[15] Non-profits also utilize different approaches to financing, as they tend to be less leveraged and have lower values of operational self-sufficiency.

INSERT Table 2.2

In Tables 2.3A and 2.3B, I then breakdown the same variables by whether or not the organizations take deposits, separately for non-profits and for-profits. Many of the same relationships hold between deposit-taking and non-deposit-taking institutions as held between for-profits and non-profits. In other words, deposit-taking institutions more closely resemble for-profit organizations, in that they are larger, make larger loans, target a lower percentage of female borrowers and are more leveraged. This is consistent with the notion that deposit-taking tends to better fit with the for-profit business model.

INSERT Table 2.3A

INSERT Table 2.3B

[15] The difference in targeting of female borrowers is only statistically significant when I control for country-year effects.

3.3 Analysis

In Tables 2.10A and 2.10B, I explore the effects of deposit-taking on operating and financial expenses for for-profit and non-profit firms, respectively. Using firm fixed effects, I run the ratio of operating expenses to loan portfolio, Model 1, and financial expenses to assets, Model 2, on controls for deposit-taking.

In Model 1, non-profits have an increase in operating expenses when they begin accepting deposits, as captured by the positive and significant coefficient on *After Deposits*, supporting Hypothesis 1a for non-profit organizations. I do not find such a significant operating expense effect of deposit-taking for for-profit organizations in Table 2.10A. However, since the coefficient magnitude of that variable is larger than for non-profit organizations, I do not find convincing evidence in support of Hypothesis 1b. In addition, non-profits have lower financial expenses as captured by the negative and significant coefficient on *Deposits to Assets*. Since the effect on financial expenses is one of lowering the marginal cost of raising external funding, it makes sense that this effect should be on *Deposits to Assets* as it will lower the cost more depending on the extent to which deposits are used as a source of funding. Again in Table 2.10A, there is no significant effect but the magnitude is of the same size for for-profits, again indicating the Hypothesis 1a is supported for non-profit organizations but Hypothesis 1b cannot be conclusively supported.

INSERT Table 2.10A

INSERT Table 2.10B

In Tables 2.11A and 2.11B, I look at the effect of deposit-taking in for-profit and non-profit organizations, respectively, by running the regression of the three performance variables, *Operational Self-Sufficiency, Return on Assets, and Profit Margin* in Models 1, 2, and 3 on the indicator for whether or not the organization takes deposits, as well as the amount of deposits to assets. I find that on average, deposit-taking among non-profit organizations seems to lower *Operational Self-Sufficiency* and *Return on Assets*, through the negative coefficient on *Deposits to Assets* and

the deposits indicator, respectively.

INSERT Table 2.11A

INSERT Table 2.11B

In Tables 2.12A and 2.12B, I examine whether the effect differs in for-profit and non-profit organizations that scale up their operations at the same time, by adding in the control for deposit-taking by organizations that scale up. In Table 12B, the negative coefficients on *Deposits to assets* and the deposit taking indicator for non-profits hold in Models 1 and 2, but there is a positive coefficient for the organizations that scale up. The magnitudes imply that the net effect for non-profit organizations that scale up is positive, so non-profits that scale up their operations see an improvement in *Operational Self-Sufficiency* and *Return on Assets*. In addition, they also improve in *Profit Margin*. However, I find no such complementarities in for-profit organizations in Table 2.12A, so Hypothesis 2a holds only for non-profit organizations. These two results together, however, are supportive of Hypothesis 2b.

INSERT Table 2.12A

INSERT Table 2.12B

Finally, in Tables 2.13 and 2.14, I analyze whether this effect of scaling up is moderated by competition with or augmented by legitimacy from for-profits by including controls for the average loan difference as described in the data section. In other words, if the competitive effect dominates the legitimacy effect, I expect that scaling up may lead to lower performance gains if the organization has more overlap in terms of borrowers targeted with for-profit organizations in the same country and year. In Table 2.13B, the positive coefficient on deposit-taking by scaling up organizations remains in Model 1. However, I also find that deposit-taking non-profit institutions that scale up do worse the larger the percentage of loans made by for-profit organizations in the country and year. In other words, the complementarities still hold for non-profit organizations, however, the

performance effect may be mitigated by competitive concerns. Thus, I find support for Hypotheses 3 in non-profit organizations, in terms of the moderation of the positive performance effect due to loss of differentiation from for-profit competitors. In Table 2.14b, I find a similar result with a positive coefficient on the interaction of deposit-taking and scaling up, but a negative coefficient on deposit-taking and penetration. Thus, the gains to deposit-taking are smaller the more the country's poor borrowers are already served by the microfinance market.

INSERT Table 2.13A

INSERT Table 2.13B

INSERT Table 2.14A

INSERT Table 2.14B

4 Discussion and Conclusion

4.1 Robustness and Limitations

This study provides a look at how profit status plays a role in the business models and product market characteristics that an organization pursues. As a result of these differences, the performance implications from adopting business tools may differ. In particular, I find complementarities between adopting deposits and scaling up loan size in non-profit organizations, but do not find them in for-profit organizations. In addition, this complementarity is moderated by competition with for-profit organizations. Deposit-taking requires more change in the non-profit business model, and thus attempting to utilize this for-profit business tool without making simultaneous product market changes is ineffective at improving financial performance.

There are a number of alternative explanations, a few of which are examined below, as well as limitations which present valuable avenues for future research. First, because of data limitations, I focus on a purposefully selected subsample of data. However, acquiring better data would assuage

concerns of sample selection. Some recent work in microfinance has utilized data from ratings agency (Baquero *et al.*, 2012), and verifying these results with alternate sources would be a useful endeavor. My data is also limited in that I cannot look at changes in profit status, and understanding how organizations that transform their legal status differ in the use of deposit-taking, as well as the resulting performance implications, would provide an additional layer of depth. Finally, while I control for country differences and use firm fixed effects, one mechanism through which deposit-taking changes the business model of non-profit organizations is through additional regulation. This effect would then differ by how onerous the regulation is and the type of regulation that the non-profit becomes subject to by taking deposits. Thus, one potential avenue for future research is to examine whether the findings presented differ according to the regulatory regime in the country, or to examine the effect of regulatory changes.

4.1.1 Adverse Selection

While my results look at fixed effects at the firm level and should to some extent control for prior performance, there is still concern that there is adverse selection in the organizations that take deposits, as perhaps non-profits only begin accepting deposits if they are struggling to get donations. I thus consider the determinants of deposit-taking by profit status in Table 2.9. I only consider the first year that an organization took deposits as I am investigating the decision to take deposits as a long-term choice and not a year-by-year decision. Thus, I drop all observations after the first-year that an organization took deposits and regress the deposit-taking indicator on firm and country variables with a one year lag. Table 2.9 presents the results with year indicators and estimated with a Probit model as the dependent variable is an indicator. Model 1 presents the results for for-profit organizations and Model 2 presents the results for non-profit organizations. I find that a larger average loan size in the prior year is positively and significantly associated with deposit-taking for for-profits but negatively, although not statistically significant, associated with deposit-taking for non-profits. However, I do not find evidence that non-profits that accept deposits were performing worse prior to accepting deposits, although I do find evidence that better performing for-profits in terms of operational self-sufficiency are more likely to accept deposits in the following year. Thus, while there are differences between for-profits and non-profits in the decision to accept deposits which merit further consideration, the concern about adverse selection among non-profits does not

seem to explain my results.

INSERT Table 2.9

4.1.2 Alternative Performance Measures

While the results are supportive of the notion that non-profit organizations need to change borrowers targeted in order to benefit from adoption of deposit-taking in terms of financial performance, another possible explanation is that the objectives of organizations which scale up are different from those that do not. In other words, perhaps those non-profits that scale up their operations have a goal of improving financial performance, whereas non-profits that do not scale up their operations have a different objective and thus improvements may occur in dimensions besides financial performance. To address these concerns, I look at the number of borrowers reached and the average loan balance per borrower as a function of whether the organization scaled up and whether the organization added deposits in just non-profit organizations in Figures 2.3 and 2.4. Figure 2.3 provides further suggestive evidence of the complementarities found in my paper, as non-profits that scaled up and took deposits saw growth in the number of borrowers, whereas those that did not scale up and added deposits saw less growth in the number of borrowers as compared to those that also did not scale up but did not add deposits. In other words, this graph supports the existence of complementarity between scaling up and accepting deposits as the two types of organizations that have the most growth in the number of borrowers reached are those that made both changes and those that made neither. In addition, it does not seem that non-profits that stayed small and added deposits were able to reach lower income borrowers as compared to those that stayed small but did not add deposits as the average loan balance of these two groups follows a similar path as seen in Figure 2.4.

INSERT Figure 2.3

INSERT Figure 2.4

4.1.3 Type of Deposits

The prior discussion does not address the fact that non-profits may utilize deposits differently. However, in all regressions, I control for whether the organization only uses compulsory deposits and the ratio of deposits to assets to control for the type of deposits and the extent to which they are relied on. I do find some evidence that different types of deposits have different effects. For instance, in Table 2.10B, the use of solely compulsory deposits has a positive effect on return on assets, but a significantly negative effect on profit margin. This is likely due to the fact that those organizations that use only compulsory deposits have a much smaller average loan balance, and thus make less profitable loans. The negative effect on profit margin is found in Tables 2.11B and 2.12B as well. Thus, while I control for the use of deposits in this way, understanding the mechanisms and effects of this type of deposit-taking is a useful area of future research.

4.2 Conclusion

"We provide a broader range of services than for-profits...What you have seen in microfinance is entities focusing on what they have been most successful at, not just in terms of profitability but in terms of growth...define success as growth." (Source 1, Investment Officer at Microfinance Network)

Non-profit and for-profit microfinance institutions on average target different populations and utilize different business models. In this paper, I show that non-profits that begin taking deposits only benefit financially from this adoption if they also begin making larger loans. This suggests that changes in non-profits' activities may require change in positioning to improve financial performance. This may be coming from a number of different factors, including complementarity in organizational structure, accountability to new stakeholders, and consistency in organizational logic. More broadly, it supports the literature on the importance of fit between product market strategy and business model (Zott & Amit, 2008), which suggests extra managerial attention be paid to whether and how to adopt activities which change the business model.

In addition, this result is moderated by the amount of competition in the same country and year, particularly when that competition is with for-profit organizations. As a result, it is unclear

whether there will be any benefit to adoption of deposit-taking and scaling up loan size in the future as non-profits face increasing competition from for-profit organizations and donations continue to decline. In other words, my results are perhaps cause for concern in that they suggest non-profits need to compete like a for-profit and with for-profits by making simultaneous financing and loan size changes, but that they will suffer the more they overlap with for-profits. Importantly, both for-profits and non-profits begin accepting deposits during this period, and in future work, I plan to consider the diffusion of this source of financing. In particular, this paper can be thought of as the first step in analyzing a relevant and novel question: when a product or practice emerges which is a better fit with a competing business model, should it be adopted?

Figure 2.1: Total Loan Amount by Profit Status

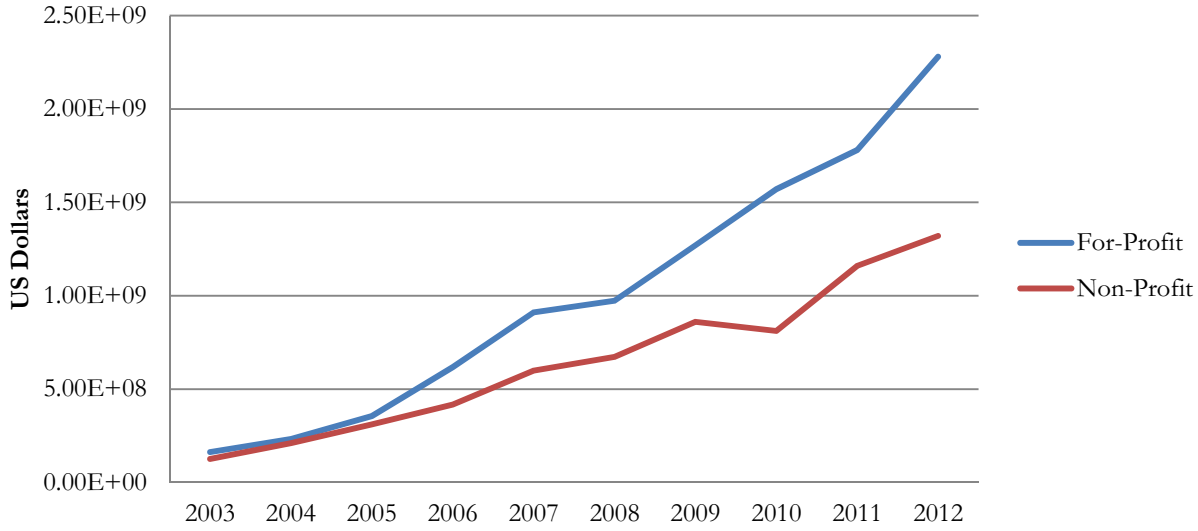
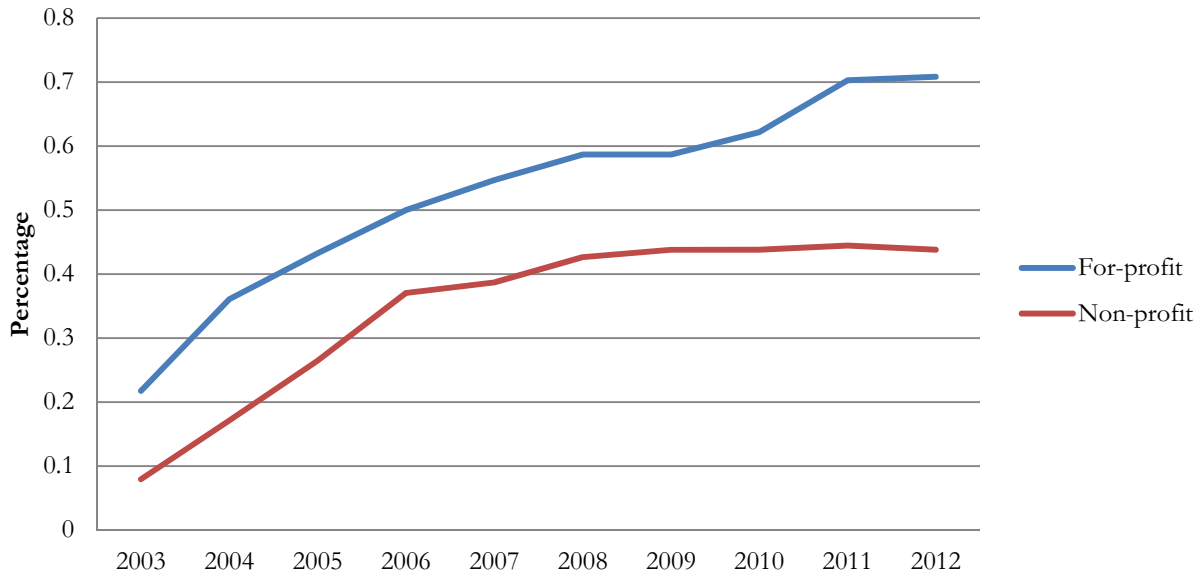


Figure 2.2: Incidence of Deposit Taking



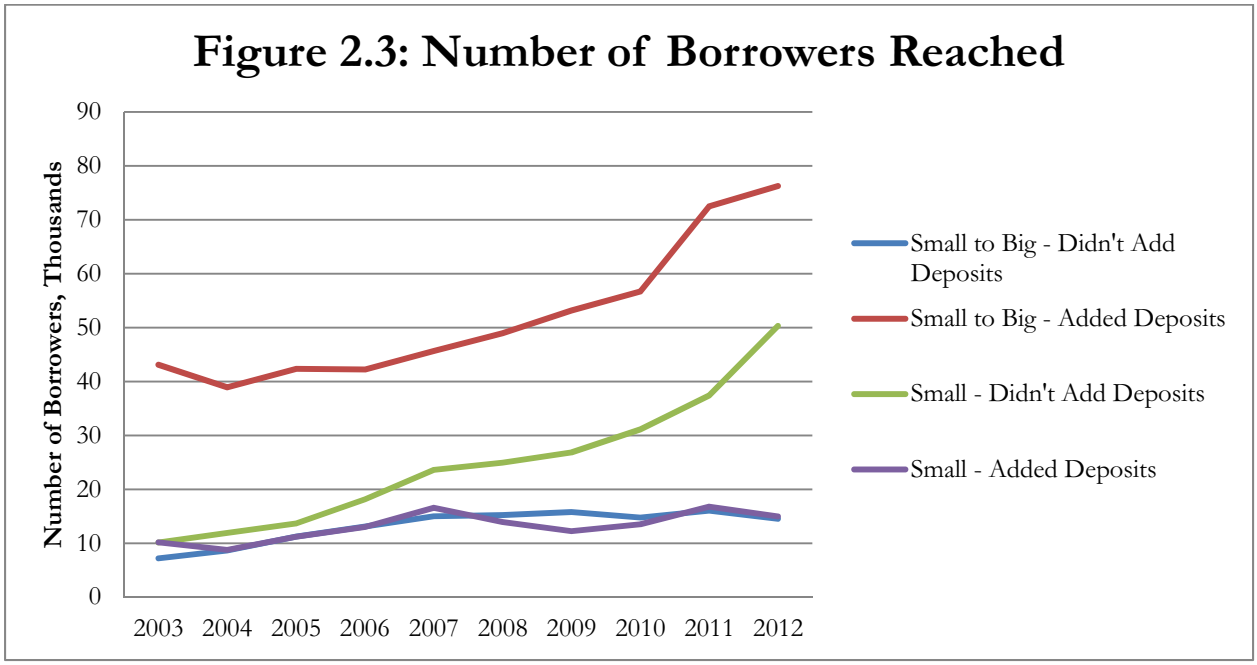


Figure 2.3: Number of Borrowers Reached
Number of Borrowers, Thousands
90
80
70
60
50
40
30
20
10
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Small to Big - Didn't Add Deposits
Small to Big - Added Deposits
Small - Didn't Add Deposits
Small - Added Deposits

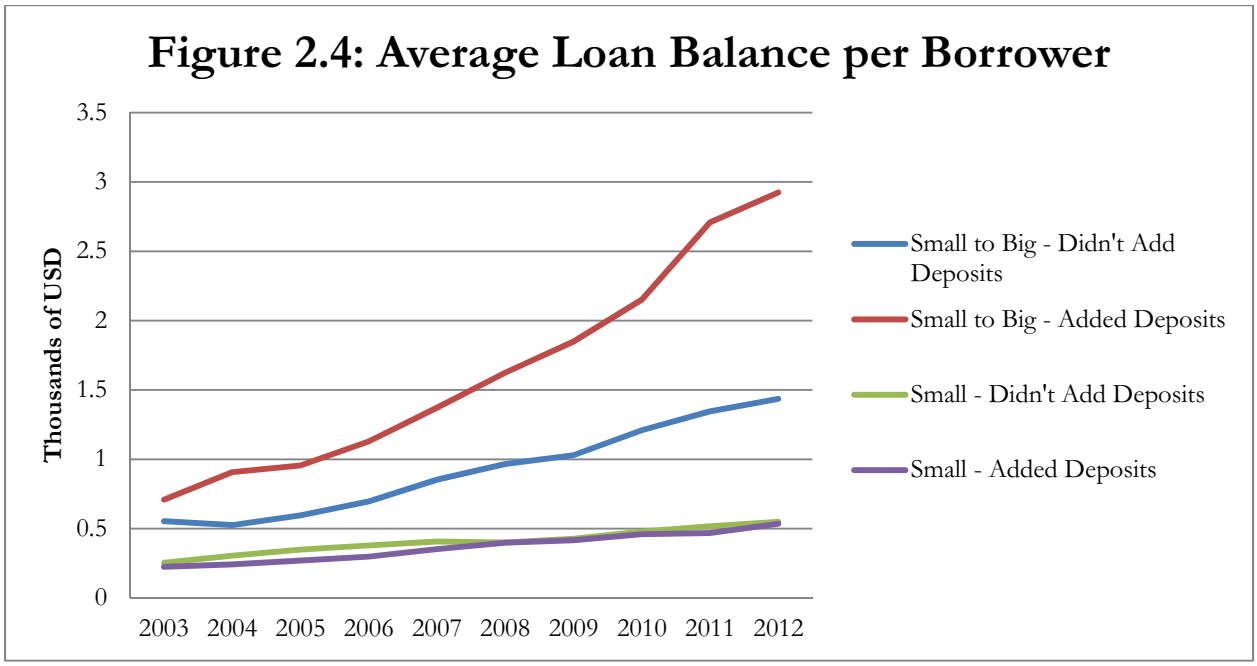


Figure 2.4: Average Loan Balance per Borrower
Thousands of USD
3.5
3
2.5
2
1.5
1
0.5
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Small to Big - Didn't Add Deposits
Small to Big - Added Deposits
Small - Didn't Add Deposits
Small - Added Deposits

Table 2.1A: Variable Descriptions for Firm-Level Variables		
Variable	*Source*	*Description*
Non-Profit Indicator (0 or 1)	MIX Market	An indicator capturing whether the firm identifies as a non-profit.
Deposits (Millions of $s)	MIX Market	Total deposits, whether voluntary, compulsory, retail or institutional.
Portfolio at risk - 30 days (%)	MIX Market	The value of all loans outstanding that are past due more than 30 days over the total loan portfolio.
Gross loan portfolio (Millions of $s)	MIX Market	All outstanding principals due for all outstanding client loans.
Percent of Female Borrowers (%)	MIX Market	Number of active borrowers who are female over total number of borrowers.
Operational Self-Sufficiency	MIX Market	Financial Revenue over the sum of Financial Expense, Impairment Loss, and Operating Expense.
Return on Assets	MIX Market	Net operating income, less taxes, over assets, where net operating income is defined as Financial Revenue less the sum of Financial Expense, Impairment Loss, and Operating Expense.
Profit Margin	MIX Market	Net operating income over financial revenue.
After Deposits	MIX Market/Author	An indicator which is defined to be 1 for a firm in all years after it first has a positive deposits amount.
Small to Big	MIX Market/Author	An indicator which is defined to be 1 for organizations that have a loan size less than $1,000 in their first year and more than $1,000 in their last year.
Loan Difference	MIX Market/Author	The difference between the average loan balance per borrower and the average value of this variable for for-profit organizations in the same country-year.
Deposits to Assets	MIX Market	The total amount of deposits over the total assets.
Compulsory Deposits Only	MIX Market/Author	An indicator which is defined to be 1 for organizations that only use compulsory deposits.
Number of Active Borrowers (thousands)	MIX Market	The number of individuals or entities who currently have an outstanding loan balance with the MFI.
Average Loan Balance per Borrower (thousands)	MIX Market	Gross loan portfolio over number of active borrowers.

Table 2.1B: Variable Descriptions for Country-Level Variables		
Variable	*Source*	*Description*
Sum of Gross Loan Portfolio ($)	MIX Market/Author	The sum of the gross loan portfolio of all firms in a given country and year.
Percent of Total Loans by For-Profits (%)	MIX Market/Author	The percentage of the total loans in a given country-year which are accounted for by a firm classified as a for-profit.
Borrowers as a percentage of the poor population (%)	MIX Market/WDI/Author	Defined as the sum of the total number of borrowers served by all firms in a given country and year over the product of the population and the percentage of the population living on under $3.10 per day.
Unemployment (%)	WDI	The percentage of the population in a country and year which are classified as unemployed.
Urban (%)	WDI	The percentage of the population in a country and year which reside in an urban environment.
Female (%)	WDI	The percentage of the population in a country and year which are female.
Inflation Rate	WDI	Foreign direct investment in a given country and year, net inflows (% of GDP).
GDP Growth	WDI	GDP growth in a given country and year (annual %) .
FDI	WDI	Foreign direct investment in a given country and year, net inflows (% of GDP).

Table 2.2: Summary Statistics, Differences by Profit Status

	For-Profit	**Non-Profit**	**T-test**	**T-stat**
Assets (Millions)	100.000	30.800	9.00***	9.48***
Gross Loan Portfolio (Millions)	79.000	23.800	9.74***	10.51***
Average Loan Balance per Borrower / GNI Per Capita	0.777	0.450	1.96*	2.55**
Portfolio at Risk - 30 Days	0.064	0.073	2.88***	5.05***
Number of Active Borrowers (Thousands)	64.797	16.966	11.57***	8.67***
Percent of Female Borrowers	0.626	0.627	0.22	7.65***
Operational Self-Sufficiency	1.146	1.138	0.5	2.66***
Capital to Asset Ratio	0.308	0.382	7.88***	10.02***
Debt to Equity	3.940	3.340	0.68	1.86*
Yield on Gross Portfolio - Real	0.368	0.263	13.11***	1.59
Personnel	478.269	123.489	13.78***	10.91***
Administrative Expenses to Assets^	0.104	0.096	1.06	2.95***
^ Sign of non-profit dummy is opposite from difference in summary statistics for this variable.				
Number of Observations	*2306*	*1428*		

Table 2.3A - Summary Statistics: Differences by Deposit-Taking and Profit Status

		Non-profit		
	No Deposits	**Deposit-taking**	**T-test**	**T-stat**
Assets (Millions)	18.14	72.34	9.54***	9.66***
Gross Loan Portfolio (Millions)	14.11	55.91	9.70***	9.84***
Average Loan Balance per Borrower / GNI Per Capita	0.41	0.57	3.35***	5.38***
Portfolio at Risk - 30 Days	0.08	0.07	2.08**	0.11
Number of Active Borrowers (Thousands)	13.40	28.05	6.17***	7.08***
Percent of Female of Borrowers	0.65	0.56	8.05***	9.31***
Operational Self-Sufficiency	1.14	1.15	0.41	1.13
Capital to Asset Ratio	0.42	0.25	13.33***	10.77***
Debt to Equity	3.03	4.29	1.89*	1.71*
Yield on Gross Portfolio - Real	0.29	0.21	9.46***	11.35***
Personnel	95.40	210.92	8.18***	9.12***
Administrative Expenses to Assets^	0.11	0.07	2.78***	1.60
^ Sign of deposit-taking dummy is opposite from difference in summary statistics for this variable.				
Observations	*1772*	*534*		

Table 2.3B- Summary Statistics: Differences by Deposit-Taking and Profit Status

		For-profit		
	No Deposits	**Deposit-taking**	**T-test**	**T-stat**
Assets (Millions)	46.94	208.31	8.68***	6.22***
Gross Loan Portfolio (Millions)	39.47	160.91	8.91***	6.84***
Average Loan Balance per Borrower / GNI Per Capita	0.74	0.84	0.22	0.36
Portfolio at Risk - 30 Days	0.07	0.06	1.16	0.12
Number of Active Borrowers (Thousands)	49.97	93.94	4.21***	3.68***
Percent of Female of Borrowers	0.62	0.63	0.44	1.83*
Operational Self-Sufficiency	1.15	1.13	0.84	1.14
Capital to Asset Ratio	0.35	0.22	9.09***	8.44***
Debt to Equity	3.94	3.94	0.00	0.41
Yield on Gross Portfolio - Real	0.40	0.33	4.47***	3.47***
Personnel	336.91	751.10	6.35***	4.44***
Administrative Expenses to Assets^	0.12	0.09	5.40***	2.65***
Observations	*963*	*465*		

Table 2.4: Number of Firms by Country

Country	Non-Profit	For-Profit	Percent Non-Profit
Argentina	11	8	57.89%
Bolivia	18	10	64.29%
Brazil	33	16	67.35%
Chile	4	3	57.14%
Colombia	30	12	71.43%
Costa Rica	17	1	94.44%
Dominican Republic	9	5	64.29%
Ecuador	54	5	91.53%
El Salvador	11	7	61.11%
Guatemala	22	1	95.65%
Haiti	5	3	62.50%
Honduras	15	12	55.56%
Jamaica	3	3	50.00%
Mexico	12	73	14.12%
Nicaragua	23	12	65.71%
Panama	2	4	33.33%
Paraguay	3	4	42.86%
Peru	45	26	63.38%
Total	*317*	*205*	*61.81%*

Table 2.5: Number of Firms by Time in Sample

Years	Non-Profit	For-Profit	Total
10	67	43	110
9	35	14	49
8	36	18	54
7	24	14	38
6	33	19	52
5	34	25	59
4	31	23	54
3	31	23	54
2	20	14	34
1	6	12	18
Total	*317*	*205*	*522*

Table 2.6: Number of Firms by Deposit Switch in Sub-Sample

	Non-Profit	**For-Profit**	***Total***
Added Deposits			
1	59	49	*108*
0	79	26	*105*
Total	*138*	*75*	*213*

Table 2.7: Number of Firms by Loan Switch in Sub-Sample

	Non-Profit	**For-Profit**	***Total***
Small to Big			
1	37	29	*66*
0	101	46	*147*
Total	*138*	*75*	*213*

Table 2.8: Number of Firms by Deposit and Loan Switch in Sub-Sample

		Non-Profit	**For-Profit**	***Total***
Small to Big	**Added Deposits**			
1	1	18	19	*36*
1	0	19	10	*29*
0	1	41	30	*72*
0	0	60	16	*76*
	Total	*138*	*75*	*213*

Table 2.9: Determinants of Deposit-Taking by Profit Status

	Model 1 **For-Profit**	**Model 2** **Non-Profit**
Assets	-1.44	48.96**
	(13.49)	(19.16)
Number of Borrowers	-0.01	-0.04**
	(0.01)	(0.02)
Average Loan Balance	6.21**	-0.40
	(2.73)	(0.41)
Portfolio at Risk - 30 days	-30.51	0.20
	(20.24)	(2.05)
Operational Self Sufficiency	8.53*	0.02
	(4.37)	(0.38)
Debt to Assets	7.01*	-0.50
	(3.61)	(0.66)
Constant	35.82	59.32*
	(41.20)	(35.61)
Observations	143	334
Year Indicators	Yes	Yes
Firm and Country Controls	Yes	Yes
R-squared	0.573	0.300

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.10A: Expense Effects of Deposit-Taking in For-Profits

	Model 1 Operating Expenses/Loan Portfolio	Model 2 Financial Expense/assets
After Deposits	0.12	0.00
	(0.11)	(0.01)
Deposits to Assets	-0.15	-0.02
	(0.26)	(0.01)
Compulsory Deposits Only	-0.12	0.00
	(0.15)	(0.01)
Number of Borrowers	0.00	-0.00***
	(0.00)	(0.00)
Average Loan Balance	0.03	0.00
	(0.03)	(0.00)
% by For-Profits	-0.80***	0.00
	(0.22)	(0.01)
Penetration	0.01**	0.00
	(0.00)	(0.00)
Constant	-27.73	-2.41***
	(17.28)	(0.92)
Observations	574	574
Number of Firms	72	72
Year Indicators	Yes	Yes
Firm and Country Controls	Yes	Yes
R-squared	0.079	0.081

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.10B: Expense Effects of Deposit-Taking in Non-Profits

	Model 1 Operating Expenses/Loan Portfolio	Model 2 Financial Expense/assets
After Deposits	0.06**	0.00
	(0.02)	(0.01)
Deposits to Assets	-0.03	-0.02*
	(0.05)	(0.01)
Compulsory Deposits Only	-0.03	0.01*
	(0.02)	(0.00)
Number of Borrowers	0.00	-0.00*
	(0.00)	(0.00)
Average Loan Balance	0.00	0.00
	(0.00)	(0.00)
% by For-Profits	0.02	0.01
	(0.04)	(0.01)
Penetration	0.00	0.00**
	(0.00)	(0.00)
Constant	3.78	-0.51
	(3.96)	(0.84)
Observations	922	921
Number of Firms	134	134
Year Indicators	Yes	Yes
Firm and Country Controls	Yes	Yes
R-squared	0.113	0.089

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.11A: Performance Effect of Deposit-Taking in For-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	-0.01	-0.02	66.50***
	(0.03)	(0.04)	(23.37)
Deposits to Assets	0.05	0.00	-112.68**
	(0.06)	(0.08)	(49.86)
Compulsory Deposits Only	0.00	-0.05	-27.92
	(0.03)	(0.05)	(30.90)
Number of Borrowers	-0.00*	0.00	
	(0.00)	(0.00)	
Average Loan Balance	-0.01	0.00	-14.02**
	(0.01)	(0.01)	(6.82)
% by For-Profits	0.17***	0.20***	101.97**
	(0.05)	(0.07)	(49.58)
Penetration	0.00	0.00	-0.15
	(0.00)	(0.00)	(1.03)
Constant	4.18	0.39	9720.38**
	(4.03)	(5.55)	(3771.33)
Observations	574	581	616
Number of Firms	72	72	72
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.062	0.108	0.201

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Table 2.11B: Performance Effect of Deposit-Taking in Non-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	-0.03**	-0.07	-7.91*
	(0.02)	(0.07)	(4.71)
Deposits to Assets	0.03	-0.16	16.62*
	(0.03)	(0.14)	(8.76)
Compulsory Deposits Only	0.03**	0.06	3.80
	(0.01)	(0.06)	(4.57)
Number of Borrowers	0.00	0.00	
	(0.00)	(0.00)	
Average Loan Balance	0.00	0.00	0.02
	(0.00)	(0.01)	(0.46)
% by For-Profits	0.03	-0.11	29.72***
	(0.03)	(0.12)	(8.78)
Penetration	0.00	0.00	-1.16***
	(0.00)	(0.00)	(0.20)
Constant	0.37	1.56	2731.51***
	(2.50)	(10.92)	(760.63)
Observations	921	953	1006
Number of Firms	134	134	134
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.057	0.041	0.252

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Table 2.12A: Synergies with Deposit-Taking in For-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	-0.01	0.01	106.69***
	(0.03)	(0.05)	(28.55)
Small to Big*After Deposits	-0.01	-0.06	-84.86**
	(0.05)	(0.06)	(34.96)
Deposits to Assets	0.04	-0.02	-134.50***
	(0.06)	(0.09)	(50.43)
Compulsory Deposits Only	0.00	-0.06	-41.72
	(0.03)	(0.05)	(31.27)
Number of Borrowers	-0.00*	0.00	
	(0.00)	(0.00)	
Average Loan Balance	-0.01	0.00	-13.41**
	(0.01)	(0.01)	(6.79)
% by For-Profits	0.17***	0.20***	96.09*
	(0.05)	(0.07)	(49.41)
Penetration	0.00	0.00	-0.06
	(0.00)	(0.00)	(1.03)
Constant	4.05	-0.49	8638.08**
	(4.09)	(5.63)	(3780.17)
Observations	574	581	616
Number of Firms	72	72	72
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.062	0.11	0.21

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Table 2.12B: Synergies with Deposit-Taking in Non-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	-0.03**	-0.07	-8.32*
	(0.01)	(0.07)	(4.72)
Small to Big*After Deposits	0.13***	0.22	8.71
	(0.04)	(0.15)	(6.52)
Deposits to Assets	0.01	-0.21	11.97
	(0.03)	(0.15)	(9.42)
Compulsory Deposits Only	0.03**	0.05	3.72
	(0.01)	(0.06)	(4.57)
Number of Borrowers	0.00	0.00	
	(0.00)	(0.00)	
Average Loan Balance	0.00	0.00	0.03
	(0.00)	(0.01)	(0.46)
% by For-Profits	0.03	-0.12	29.66***
	(0.03)	(0.12)	(8.77)
Penetration	0.00	0.00	-1.17***
	(0.00)	(0.00)	(0.20)
Constant	2.64	6.40	2857.58***
	(2.57)	(11.42)	(766.10)
Observations	921	953	1006
Number of Firms	134	134	134
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.072	0.043	0.253

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

Table 2.13A: For-Profit Competition from Deposit-Taking in For-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	0.32***	0.28***	191.84***
	(0.07)	(0.09)	(58.71)
Small to Big*After Deposits	-0.01	0.03	-70.87
	(0.08)	(0.12)	(82.77)
After Deposits*% For-Profit	-0.56***	-0.48***	-147.60*
	(0.10)	(0.14)	(84.82)
After Deposits*Small to Big*% For-Profit	0.05	-0.10	-6.19
	(0.12)	(0.16)	(115.13)
Deposits to Assets	0.02	-0.04	-126.04**
	(0.06)	(0.09)	(51.06)
Compulsory Deposits Only	-0.02	-0.07	-48.52
	(0.03)	(0.05)	(31.51)
Number of Borrowers	-0.00***	-0.00*	
	(0.00)	(0.00)	
Average Loan Balance	-0.01	0.00	-12.14*
	(0.01)	(0.01)	(6.81)
% by For-Profits	0.54***	0.53***	181.65***
	-0.08	-0.11	-65.78
Penetration	0.00	0.00	0.09
	(0.00)	(0.00)	-1.03
Constant	8.05**	2.63	9827.94**
	(4.00)	(5.60)	(3821.56)
Observations	574	581	616
Number of Firms	72	72	72
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.13	0.142	0.215

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.13B: For-Profit Competition from Deposit-Taking in Non-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	-0.03	-0.19	-1.17
	(0.04)	(0.18)	(12.28)
Small to Big*After Deposits	0.24***	0.34	-18.14
	(0.05)	(0.24)	(13.62)
After Deposits*% For-Profit	0.00	0.18	-12.77
	(0.05)	(0.24)	(16.82)
After Deposits*Small to Big*% For-Profit	-0.20***	-0.22	49.70**
	(0.07)	(0.33)	(22.11)
Deposits to Assets	0.01	-0.19	11.40
	(0.03)	(0.15)	(9.57)
Compulsory Deposits Only	0.02	0.05	5.47
	(0.01)	(0.06)	(4.63)
Number of Borrowers	0.00	0.00	
	(0.00)	(0.00)	
Average Loan Balance	0.00	0.00	0.00
	(0.00)	(0.01)	(0.46)
% by For-Profits	0.04	-0.16	30.39***
	(0.03)	(0.14)	(9.94)
Penetration	0.00	0.00	-1.17***
	(0.00)	(0.00)	(0.20)
Constant	1.45	5.23	3183.84***
	(2.59)	(11.61)	(779.40)
Observations	921	953	1006
Number of Firms	134	134	134
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.083	0.044	0.258

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.14A: Competition from Deposit-Taking in For-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
After Deposits	0.03	0.06	116.15***
	(0.04)	(0.06)	(35.06)
Small to Big*After Deposits	-0.05	-0.18**	-153.39***
	(0.06)	(0.08)	(46.64)
After Deposits*Penetration	0.00	0.00	-0.13
	(0.00)	(0.00)	(1.04)
After Deposits*Small to Big*Penetration	0.00	0.00**	2.03**
	(0.00)	(0.00)	(1.00)
Deposits to Assets	0.08	0.03	-119.09**
	(0.07)	(0.09)	(52.68)
Compulsory Deposits Only	0.00	-0.07	-42.91
	(0.03)	(0.05)	(31.72)
Number of Borrowers	-0.00*	-0.00*	
	(0.00)	(0.00)	
Average Loan Balance	-0.01	0.00	-13.48**
	(0.01)	(0.01)	(6.78)
% by For-Profits	0.18***	0.20***	92.17*
	-0.05	-0.07	-49.26
Penetration	0.00	0.00	-0.81
	(0.00)	(0.00)	-1.24
Constant	4.06	-0.61	8698.69**
	(4.09)	(5.62)	(3771.43)
Observations	574	581	616
Number of Firms	72	72	72
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.065	0.119	0.218

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 2.14B: Competition from Deposit-Taking in Non-Profits

	Model 1 Return on Assets	Model 2 Operational Self Sufficiency	Model 3 Number of Active Borrowers
----------	----------	----------	----------
After Deposits	-0.02	0.02	-14.95***
	(0.02)	(0.08)	(5.26)
Small to Big*After Deposits	0.12***	0.16	16.80**
	(0.04)	(0.16)	(7.36)
After Deposits*Penetration	-0.00**	-0.01***	0.38***
	(0.00)	(0.00)	(0.14)
After Deposits*Small to Big*Penetration	0.00	0.00	-0.35**
	(0.00)	(0.00)	(0.16)
Deposits to Assets	0.03	-0.06	8.85
	(0.03)	(0.15)	(9.66)
Compulsory Deposits Only	0.03**	0.05	3.56
	(0.01)	(0.06)	(4.55)
Number of Borrowers	0.00	0.00	
	(0.00)	(0.00)	
Average Loan Balance	0.00	0.00	-0.05
	(0.00)	(0.01)	(0.46)
% by For-Profits	0.02	-0.16	31.50***
	(0.03)	(0.12)	(8.79)
Penetration	0.00**	0.00	-1.31***
	(0.00)	(0.00)	(0.21)
Constant	2.31	3.85	3053.61***
	(2.56)	(11.36)	(766.63)
----------	----------	----------	----------
Observations	921	953	1006
Number of Firms	134	134	134
Year Indicators	Yes	Yes	Yes
Firm and Country Controls	Yes	Yes	Yes
R-squared	0.081	0.059	0.26
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Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Chapter 3

Employee Incentives in Microfinance Institutions: Examining the Importance of Diversification and Profit Status

ABSTRACT

Non-profits across the economy are being pressured to take on the human resource management practices of for-profits, including the use of pay-for-performance. However, the use of pay-for-performance and competitive salaries is often thought to conflict with the non-profit business model, due to multidimensional organizational objectives and the effect of monetary incentives on intrinsically motivated employees. In this paper, I argue that performance-based pay can actually be effective if non-profit employees are driven by both the intrinsic value of the mission and a relational contract with the firm, wherein performance-based pay serves as a signal of organizational mission, rather than an effort-inducing financial incentive. The context of this paper is the microfinance industry, with data that includes observations on both for-profit and non-profit firms and variables that capture both financial and social goals. This data allows me to examine the ways in which non-profits utilize employee incentives and how they compare with for-profits in the same industry. I find that non-profit organizations, on average, pay employees less and utilize a lower level of performance-based pay. Further, non-profit organizations that target lower income borrowers reward employees on more dimensions than other microfinance firms. Even controlling for the products and services that firms offer, some differences in employee compensation between for-profit and non-profit organizations remain. This result suggests that neither the explanation of intrinsic motivation of employees nor the distinct products and services offered completely explain the different salary structures in non-profit organizations; rather different incentive dimensions may be used to signal the non-profits' goals.

Keywords: *non-profit strategy; pay-for-performance; microfinance*

1 Introduction

Performance-based pay is used much less often in practice than would be expected based on its predicted advantages from agency theory (Zenger, 1992; Larkin *et al.,* 2012). Two key reasons that performance-based pay may be used less often is that it may crowd out employees' intrinsic motivation (Frey & Oberholzer-Gee, 1997) and the goals of the organization may not be able to be precisely defined in advance (Baker, 1992). Both of these factors are frequently important in the non-profit sector, where pay-for-performance is particularly scarce (Ben-Ner *et al.,* 2011). However, in this paper, I argue that these two factors can interact in a counter-intuitive manner and in fact allow non-profit organizations to utilize employee incentives to effectively signal the goals of the organization.

Classic results from the economics-based, agency theory view of pay-for-performance suggest that explicit contracts can be made when there are performance metrics that are measurable and can be specified in advance, as exemplified by the piece rate system studied in Lazear (2000). However, this literature suggests that rewarding proxies for the desired outcome, rather than the desired outcome itself, can backfire as employees focus their attention on the rewarded outcome (Holmstrom & Milgrom, 1991; Gibbons, 1998). Hence, the alignment between the performance metric and the organizational goal is key to evaluating the effects of pay-for-performance.[1]

Related papers argue that when the desired outcome cannot be specified in advance, subjective contracts based on repeated interactions can be utilized (Baker *et al.,* 1994). The non-profit setting is often characterized by such difficult to measure, and sometimes even contradictory, organizational goals (Jäger & Mitterlechner, 2004). The non-distribution constraint that non-profits must follow, prohibiting profit from being distributed to "owners", may facilitate a level of trust that enables these organizations to obtain donations, from both external donors and employees (Hansmann, 1980), including through relational contracts. By relational contract, I mean "collaboration sustained by the shadow of the future" (Gibbons & Henderson, 2012). Because relational

[1] Other distortions can occur, such as if the reward system is nonlinear, as shown in Oyer (1998) and Larkin (2007), but that is beyond the scope of this paper.

contracts are thus built on trust, the non-distribution constraint allows relational contracts to be a key element of the non-profit human resource system. A greater reliance on relational contracts is consistent with a lower prevalence or a weaker steepness of incentive of performance-based pay (Grossberg & Sicilian, 2012).

Psychology literature suggests that when people are intrinsically motivated, extrinsic rewards can actually backfire by crowding out this intrinsic motivation, with the classic example coming from the willingness to donate, rather than being paid for, blood (Titmuss, 1971). In particular, the argument is that monetizing donated efforts diminishes the intrinsic motivation for donations.[2] Empirical work has supported this effect, largely through lab (e.g., Heyman & Ariely, 2004; Ariely *et al.,* 2009), and field (Gneezy & Rustichini, 2000a; 2000b) experiments, including one directly testing Titmuss' original blood donation setting (Mellström & Johannesson, 2008).

There is still a debate about whether such crowd out effects apply in work settings (Gneezy *et al.,* 2011), even though some recent papers support crowding out in work environments. For example, Hossain & Li (2014) find that monetary rewards crowd out participation when a task is described as prosocial but not when it is described as simply work, and Burbano (2016) finds that employees are willing to accept a lower wage when working for a more socially responsible firm.

Non-profit organizations are frequently considered as having employees who are particularly motivated by intrinsic motivation (Rose-Ackerman, 1996; Francois, 2000). Hence, if non-profits provide employees with financial benefits to "doing good", they may be particularly likely to reduce workers' motivation to support the organizations' goals. It is of particular interest to examine employee compensation and such possible effects in a mixed industry, such as microfinance, where both non-profits and for-profits co-exist and compete.

In this paper, I argue that performance-based pay can actually be effective if non-profit em-

[2] Note that this can reflect either a reduction in motivation by the individuals or a change in who the individuals are. Because my empirical work aggregates analysis from the individual to the firm level, I am not able to determine to what extent each of these mechanisms is driving the results.

ployees are driven by both the intrinsic value of the mission and a relational contract with the firm. In this scenario, performance-based pay can serve as a signal of organizational mission, rather than actually incentivizing employees to perform a given action. In other words, in a for-profit, pay-for-performance can be successful, increasing profitability, if the pay incentivizes employees to increase hours (or intensity) of effort. However, in a non-profit, pay-for-performance can instead be successful by simply guiding where that effort is focused, and thus the pay achieves alignment with the non-profit's goals and actual rewards can be small. This idea importantly relies on both the intrinsic motivation of employees and their shared purpose with the non-profit institution. The shared purpose with the institution may help to prevent the gaming behavior as found in the award systems described in Gubler *et al.* (2013). As a result, this mechanism may explain the conflicting prior findings regarding effectiveness of employee awards, as quantitatively small incentives can avoid crowding out of employees' intrinsic motivation (Frey & Meier, 2004), while still improving employee performance (Besley & Ghatak, 2008; Blanes i Vidal & Nossol, 2011).

Allowing for employee incentives to have either a signaling or an intensity effect in different contexts generates hypotheses regarding the relationship between the number of incentives and the amount of performance-based pay in organizations with varying objectives or mission focus. The context where I study these issues is microfinance, where non-profit and for-profit firms co-exist, thereby providing useful within-industry variance that I explore in my analysis. In addition, nearly all firms in this industry, including non-profits, are using some amount of bonus payments (Mersland & Strom, 2009), so my analysis addresses an economically important practice in the industry. In this paper, I use this "signaling theory" of employee incentives to understand the frequent, but distinct, use of performance-based pay by for-profit and non-profit organizations in microfinance.

I examine these issues using a novel dataset, combining a survey of the social performance of microfinance institutions with the commonly used balance sheet data from MIX Market. The social performance survey, also run by the MIX, covers questions about incentives and benefits offered to employees, products and services the organization offers, and internal training and processes. Thus, I can use this cross-sectional survey information to understand which types of firms offer employee incentives and whether the relationship between firm characteristics and incentives differs by firm

profit-status. In addition, I use the panel of balance sheet data to create a proxy for the amount of performance-based pay. By looking at the correlation between the average total compensation and the number of borrowers per employee, I create a metric that captures elements of both a profit-maximizing or outreach-maximizing objective function.

I find that non-profit organizations, on average, pay employees less and utilize a lower level of performance-based pay, but do not motivate employees on fewer dimensions. Indeed, non-profit organizations that target lower income borrowers actually reward employees on more dimensions. Even controlling for the products and services that firms offer, there are some differences between for-profit and non-profit organizations, with employees of for-profits receiving higher compensation. These results are supportive of the idea that non-profits use employee incentives to signal organizational objectives, as those firms that are more focused on lower income borrowers utilize a greater number of dimensions but not a higher level of performance-based pay.

The rest of this section reviews the background literature on non-profits' human resources, and strategic human resource theory more broadly. Section 2 develops the hypotheses, motivated by the literature and industry context. Section 3 describes the data and presents the empirical analyses, Section 4 discusses the results and limitations, and Section 5 concludes.

1.1 Literature Review

Two of the key differences between non-profit and for-profit organizations are the products and services they offer and the motivation of employees (Oster, 1995). The first difference stems from the legal definition of a non-profit organization, which is that it must abide by the non-distribution constraint, whereby profits cannot be redistributed to its "owners". As a result, donors can trust that services will be rendered as charity for other customers (Hansmann, 1980). In other words, the idea is that non-profits exist to utilize donations to provide goods and services that are not privately profitable to offer to its customers.

In addition, non-profits are often thought to hire a distinct type of person, motivated by personal social views (Rawls *et al.,* 1975). This view implies that such employees may be attracted

to the non-profit not only by its distinct goods and services but also by its distinct culture and organizational structure. This view of non-profits is consistent with business model innovation, wherein distinct employee relationships and sources of funding generate a distinct business model and source of advantage for non-profits (Zott & Amit, 2007).

Consistent with this view, it is generally accepted that non-profit employees are motivated by intrinsic motivation and thus non-profits pay employees less (Aubert *et al.,* 2009). In fact, many believe that paying employees more may actually undermine this intrinsic motivation (Delfgaauw & Dur, 2007), partly due to selecting different types of employees (Weisbrod, 1998). While some empirical work has documented that non-profit employees are indeed paid less (e.g., Mirvis & Hackett, 1983), and that non-profits utilize pay-for-performance less frequently, the empirical work is still quite mixed on the relationship between profit status and employee pay (Mocan & Tekin, 2003; Leete, 2001; Ruhm & Borkowski, 2003; Preston, 1989; Weisbrod, 1983). My paper addresses this issue by not only looking within a mixed industry, as suggested by Mirvis & Hackett (1983), but also examining the mix of products and services offered by the individual firms to get a sense of how firm "scope" and its incentives to employees interact.

There is conflicting literature on how non-profits should structure and organize their internal human resource processes to best retain their competitive advantage in the increasingly common situations where they face competition from for-profit and hybrid organizations (Dees & Anderson, 2003).[3] On one hand, the human resource policies and employee relationships of non-profits are often cited as one of the key distinguishing elements of the non-profit business model, with volunteers and lower-paid employees constituting a large proportion of the non-profit's workforce (Ridder & McCandless, 2010). On the other hand, non-profits are being encouraged by donors and external stakeholders to be more "business-like" in their internal processes, including in their hiring and compensation decisions (Eisenberg, 1997; Erus & Weisbrod, 2003). One form of becoming more "business-like" is to increasingly rely upon formalized, performance-based contracts and hiring processes for employees.

[3] By hybrid organization, I mean "one that combines different institutional logics in unprecedented ways" (Battilana & Dorado, 2010).

More generally, the existing theoretical literature acknowledges that the fit between the strategy of the organization and the human resource (HR) system is important and differences in fit should lead to performance heterogeneity (Schuler & Jackson, 1987; Wright & Snell, 1998). However, this common wisdom has often not been supported by the results of empirical research (Becker & Huselid, 1998; Delery & Doty, 1996). Becker and Huselid (2006) argue that the work examining the fit between HR systems and firm strategy should consider more carefully how the strategy generates competitive advantage relative to other firms. Along those lines, this paper suggests that pay-for-performance can either be used for signaling or to provide employee motivation. This indicates that different types and levels of bonuses can be used to provide competitive advantage for non-profit and for-profit firms, despite their distinct business models.

Two recent papers are most relevant to this study. The first covers non-profit human resource management, while the second focuses specifically on some aspects of HR systems in microfinance organizations. Non-profit human resource management is a fairly new field of academic study, so that the paper by Ridder and McCandless (2010) is one of the first that specifically investigates the use of human resource management in the non-profit sector.[4] These authors discuss three important strategic characteristics that affect the way human resource management is utilized in non-profits: the importance of mission, its external stakeholders, and its internal stakeholders.

The first characteristic is the importance of its value-driven orientation: i.e., the extent that the non-profit's mission and social goals are embedded in it (Ridder & McCandless, p. 127). This factor means that the conventional "efficiency" (or profitability) strategy goal may be sacrificed in order to pursue a social objective. This point is consistent with the arguments made in Oster (1995). My paper addresses this idea by controlling for the extent to which the organization targets very low income borrowers and considers other social goals (e.g., offering legal services to women).

[4] There is a growing, but relatively new, literature for managers about how to reward volunteers and to structure organizations in the non-profit sector. For instance, a 2011 New York Times article discusses how donors are now directly providing HR services and consulting support to non-profits, as human resources are cited as the most challenging part of managing a non-profit (Strom, 2011).

Second, non-profits also differ in the importance of external stakeholders. Of course, the donors are of key importance as non-profits are donation- based, but the recipients can also be integral as the over-arching goal of the non-profit is to fulfill the needs of these recipients.

Thirdly, the importance of internal stakeholders is distinct from that in for-profit organizations. Ban *et al.* (2003) find that 77 percent of interviewed employees from community development and human service non-profits cite the mission of the organization as a primary draw for them working there. This supports the idea that factors other than compensation primarily motivate non-profit employees.

These basic characteristics indicate that different human resource practices may be preferable for and more commonly used in non-profit organizations. Further, these differences may continue to be relevant for non-profits even in mixed industries like the one examined in this paper.

The importance of human resource processes in the mixed microfinance industry is examined in Battilana and Dorado (2010). These authors use a comparative case analysis of two microfinance firms in Bolivia. Both firms were originally non-profits that began transitioning to become more commercialized organizations, with hybrid goals of both social and financial performance. The two firms took different approaches and were differentially "successful". The authors find that the more successful firm had two key ingredients. First, the successful firm hired new graduates without a previous imprint from either social work or the finance sector. The less successful firm instead hired a mix from these two industries and tried to train them to work together, which lead to a clash between the logics from these two different backgrounds. Second, the successful firm focused on motivating employees through bonuses and an emphasis on "efficiency", rather than stressing its mission as the less successful firm did. This suggests that pay-for-performance can be successfully used in firms with hybrid missions, but that the effect of HR policies in mission-focused firms will depend on how the policies are structured.

2 Hypotheses Development

The underlying theory that will motivate my hypotheses is that of the importance of fit and adaptation of business and HR practices to firm characteristics.[5] In other words, non-profits can use employee incentives, but the relevant performance metric and the level of steepness of bonus pay will have to reflect the mission and business model of the organization. In particular, non-profits will reward employees on different dimensions to reflect the different services that are part of their missions. In addition, they will utilize these employee rewards as a signal, rather than to directly motivate employee's effort, and thus the amount of employee pay due to bonuses will be lower.

Pay-for-performance employee incentive plans that work well in for-profits (Lazear, 2000) may be thought of as counter to a social mission, leading to an employee interpretation that some financial measure now takes precedent over social goals (Frey *et al.,* 2013). In addition, the existence of a social mission allows the non-profit firm to use relational contracts as a form of reward for employees with utility functions that value the firms mission (Murdock, 2002). In other words, non-profits harness their employee's intrinsic motivation from performing a social mission. Thus, I expect that because the non-profit status can be thought of as a commitment to serve a social mission, the following hypotheses will hold:

Hypothesis 1: (H1) For-profit microfinance employees will be paid more than non-profit microfinance employees.

Hypothesis 2: (H2) For-profit microfinance employees will have a larger share of their compensation come from pay-for-performance relative to the pay-for-performance compensation share of non-profit employees.

However, there can also be differences within firms of a given profit status, in the extent that the organizations are mission-oriented. In microfinance, this translates to variance in whether the

[5] The contingency approach, that the effect of HR practices will depend on other firm or environmental characteristics, is widely discussed, and key papers in human resource management have also used this lens (e.g., Fombrun *et al.,* 1984; Wright & Snell, 1998).

organization serves the marginally poor versus the very poor (Navajas *et al.,* 2000). Thus, besides variance based on profit status, I predict that more mission-based firms, defined here as targeting lower-income borrowers, will have a lower average total compensation and use less bonus pay based on performance outcomes:[6]

Hypothesis 3: (H3) Total compensation will be increasing in the average wealth of the borrowers served.

Hypothesis 4: (H4) The share of compensation that comes from pay-for-performance will be increasing in the average wealth of the borrowers served.

Whether the effect of targeting lower-income borrowers on the level of compensation and amount of performance-based pay should matter more in for-profits or non-profits could go either way. On one hand, perhaps in an attempt to attract intrinsically motivated employees, if for-profits are even more cognizant of crowding out of intrinsic motivation, then the effect will be stronger in for-profit organizations. However, if the for-profit status eliminates the ability to rely on intrinsic motivation, then for-profits will not alter their HR systems in order to reflect borrowers' wealth.[7] Thus, I generate the two possible conflicting hypotheses below:

Hypothesis 5: (H5) H3 and H4 will be stronger in for-profit firms than in non-profit firms.

Alternative Hypothesis 5: (AH5) H3 and H4 will be less strong in for-profit firms than in non-profit firms.

The prior literature also suggests that, when they do use incentives, mission-oriented firms will

[6] Note that while these hypotheses are presented in terms of microfinance employees, the same idea could be translated into other mixed industries, where "targeting wealthier borrowers" is replaced with the appropriate measure of being less social mission-oriented.

[7] However, to the extent that targeting wealthier borrowers also means relying on more skilled employees, whose going wage is higher, then the effect of paying employees targeting wealthier borrowers more could reflect this selection effect.

reward based on different dimensions than more profit-oriented peers, as firms need to reward on dimensions which are aligned with their objectives. Non-profit firms balance dual objectives of their financial sustainability and their social mission objectives (Horwitz & Nichols, 2009). If the objectives and dimensions can be clearly specified and contracted upon, I expect even non-profit or mission-oriented firms to use employee incentives (Ballou & Weisbrod, 2003). In fact, I might expect that organizations that focus more on the social objectives, as a financial objective will underlie all organizations through either profitability or sustainability, will base performance pay on a higher number of dimensions:

Hypothesis 6: (H6) Employees' pay-for-performance contracts will be based on more dimensions the more the organization targets the lower income population.

However, adding additional metrics into the employee performance contracts of non-profit and more mission-based firms conflicts with the classic results from psychology, where financially rewarding socially-motivated behavior can actually undermine that behavior (Deci & Ryan, 1985). Thus, despite potentially having a higher number of distinct objectives, I might expect mission-oriented firms to utilize weaker and fewer incentives. If incentivizing social dimensions is particularly difficult, then organizations that are targeting the lower income population will rely on fewer dimensions to incentivize employees, leading to the following alternative hypothesis:

Alternative Hypothesis 6: (AH6) Employees' pay-for-performance contracts will be based on fewer dimensions the more the organization targets the lower income population.

Thus, these hypotheses come together to form a general theory wherein non-profits, as well as more mission-oriented firms within a given profit status, use weaker incentives. However, they may still reward on more dimensions to capture the dual nature of their objective functions and more diverse service offerings. The testing of H6 and AH6 will provide useful insight into whether non-profits are using incentives as a signal of mission objectives, or whether even weak incentives are avoided due to concerns about crowding out of intrinsic motivation in mission-oriented firms.

3 Data and Analysis

3.1 Data

In order to test the above hypotheses, I utilize two datasets created by the Microfinance Information Exchange, hereafter MIX Market. The Social Performance survey contains cross-sectional information on the range of products and services offered by the microfinance firm, including training and education services to borrowers, as well as the incentives and benefits for its employees.[8] Firms voluntarily chose whether to respond to the survey, and those that do tend to be larger and more financially transparent, so it still contains a substantial proportion of the gross loan portfolio in the industry (Cull *et al.,* 2011; Bogan, 2012).[9] I merge the Social Performance survey with the Basic MIX MFI Data, which is available for free from the MIX and includes financial and organizational characteristics, such as average loan size, amounts and sources of funding, and profit status.[10] I focus on Latin America to limit the variance between regions of the world (Ahlin *et al.,* 2011). The sample used in my cross-sectional analysis covers 252 firms in 19 countries in 2010.

The MIX market data does not include a direct measure of the proportion of pay which comes from pay-for-performance or bonuses. Thus, I use a novel estimation technique to generate a firm-level proxy by examining how strongly financial performance correlates with personnel expenditures. Specifically, I use the correlation between the average total compensation per employee, as a ratio over the gross national income (GNI), and the average number of borrowers per employee for a given firm between 2003 and 2010, using the MIX Market Balance Sheet panel data.

[8] This data can be purchased through the MIX Market portal, by selecting to access the Premium MIX MFI Data Sets and then selecting the Social Performance Results Data Set: http://www.mixmarket.org/profiles-reports.

[9] The voluntary nature of filling out the MIX Market survey leads to selection bias in the firms analyzed. As mentioned, it tends to be the larger and more financially transparent firms that file; the firms omitted tend to be small, rural non-profit organizations. Thus, any differences I find between for-profits and non-profits are conservative estimates of the average difference. Hence, the findings regarding the effectiveness of human resource policies may not apply to these smaller non-profits. Nonetheless, the findings are still helpful in analyzing the policies for those non-profits that are more similar to for-profits in size and transparency, and thus apply to the firms facing pressure to converge, which is a key motivation of the paper.

[10] This data can be accessed through the MIX Market portal, by selecting to download the Basic MIX MFI Data Set.

The idea behind this proxy is that firms that pay employees with a higher percentage of performance-based pay will see average total compensation go up and down with changes in this measure of performance. While performance-based pay could be based on a number of metrics, as is indicated in my data on the dimensions of incentives rewarded, the number of borrowers per employee has been suggested as a key metric for both for-profits and non-profits. An interview with a portfolio manager at an impact investor that funds microfinance organizations in Latin America indicated that an organization that uses a lot of pay-for-performance for their loan officers would see a high correlation between borrowers per employee and average total compensation.[11] Then, I use this correlation and define firms with values above (below) the mean correlation to be *High (Low) Correlation* firms, suggesting a relatively high (low) level of performance-based pay.

The proxy variable suggests that the level of performance-based pay differs between for-profits and non-profits, in a way that is consistent with prior literature. In particular, the value of the high-correlation indicator variable is larger in for-profits than in non-profits, with 56% of for-profits and 47% of non-profits being classified as having a high correlation in 2010.[12] There are a couple of alternative explanations to consider besides performance-based pay that could explain the correlation between the number of borrowers per employee and the average total compensation. First, suppose the amount of money brought in goes up and so more employees are brought in. This would not be a sufficient alternate explanation because I am looking at average total compensation per employee, and thus changes just in the number of employees would not affect the estimation.

However, suppose that the additional employees brought in are of better quality then the current employees and thus demand a higher wage. This is a possible way in which changes in average total compensation could be driven by changes in firm performance without indicating the use of performance-based pay.[13] If I can show that when the number of borrowers per employee goes

[11] This manager suggested this as a key performance metric and when asked about the correlation approach, he responded, "you should see this effect comparing the same organization's average total compensation through time."

[12] This difference is statistically significant at the 10% level, for both the difference across the whole sample and for the difference when controlling for country indicator variables.

[13] A positive relationship between the number of employees and the average compensation can also arise if the firm (due to imperfect information) needs to attract more workers from a limited labor pool. However, this would be less likely if average total compensation also goes down when performance suffers in subsequent years, as described

down, average total compensation also goes down, then this explanation is less likely as hiring lower quality workers and firing the higher quality workers is implausible as a short-term response to declining performance.

Below in Tables 3.1a and 3.1b, I consider the data from two representative MFIs with high correlation values, and two with low correlation values. Note that both of the high-correlation firms have a generally declining number of borrowers per employee, but the first firm is increasing its personnel numbers whereas the second firm's are decreasing or staying constant. Thus, there does not seem to be a consistent relationship between the number of employees and the number of borrowers per employee. In addition, both firms have increases and decreases in the borrowers per employee variable that are mirrored by changes in the average total compensation. For instance, the first firm has a 2005 decline in the borrowers per employee as well as a decline in average total compensation, and both rebound in 2006. On the other hand, the two firms in Table 3.1b do not have a clear relationship between these variables, with the second firm seeing a generally declining average total compensation and the first firm with slight changes in total compensation that do not reflect changes in the borrowers per employee.[14]

INSERT Table 3.1a

INSERT Table 3.1b

In addition, firms with both flat performance, in borrowers per employee, and flat compensation will have a low value of this correlation. If the variance of performance is significantly different between for-profits and non-profits, this might systematically misestimate the level of performance-based pay in one profit status as compared to another. To address this concern, I first examine

below. See Mortensen (1986) or Mortensen and Pissarides (1999) for a review on the role of search in determining wage levels.

[14] Note that the ups and downs of the first firm might suggest use of performance-based pay based on another metric, and thus I could instead develop a proxy which is based on whether the average total compensation follows a flat trend or has many changes. My current method is clearer in what is captures and omits, in that it captures performance-based pay based on the borrowers per employee, but will potentially miss performance-based pay based on other metrics. I choose this approach due to its transparency, despite being a simplification of reality.

the time-series of the number of borrowers per employee, as well as the firm-level variance of this variable, by profit status. Figure 3.1 shows that for-profit organizations have an average total compensation that declines more over the sample period, but both types have similar movement in the borrowers per employee. When I then calculate the variance of each of these variables by MFI, I find that there is no statistically significant difference between the variance of the number of borrowers per employee. But, there is a difference in the variance of average total compensation, with a higher value for for-profit organizations at the 1% significance level. Thus, there seems to be a comparable amount of variance in the performance metric I use, and more variance of the compensation variable for for-profits, which is consistent with a higher level of performance-based pay in for-profit organizations.

INSERT Figure 3.1

3.1.1 Dependent Variables.

The dependent variables I focus on encompass three key dimensions of the compensation system employed by microfinance organizations: the level of pay, the number of incentive dimensions, and the amount of performance-based pay.

Average Total Compensation per Employee over GNI is defined by MIX Market as the personnel expense over the number of employees as a percentage of the gross national income. Thus, it captures the average amount paid out to employees, benchmarked by average income differences by country.

Number of Incentives is a variable I define that sums the number of dimensions along which the organization rewards employees. The variables on which employee incentives can be based are: portfolio quality, borrower retention, outreach to female borrowers, obtaining new borrowers from the target market, outreach to rural borrowers, the quality of client interaction, and providing social services. I also separately characterize these goals in terms of the number of incentives for financial goals and the number of incentives for social goals, where the social goals include outreach to female borrowers, outreach to rural borrowers, the quality of client interaction, and providing

social services and financial goals include the other three stated dimensions.[15]

High Correlation Indicator is the indicator variable created through the correlation analysis described above. Thus, it is a proxy for the level of performance-based pay, with 1 meaning that the firm has a value of the correlation between the number of borrowers per employee and the average total compensation above the mean correlation of 0.325 and a 0 indicating the firm has a correlation value below this mean.

When I examine the effectiveness of performance-based pay and incentives, I use five different dependent variables to reflect the incentive dimensions being analyzed. These variables are:

- *Borrower Retention Rate* is the number of active borrowers at the end of the reporting period divided by the sum of active borrowers at the beginning of the reporting period and new borrowers during the reporting period. In other words, it shows the percentage of total borrowers which carry over to the next year.
- *Percent - Female Borrowers* is the number of active borrowers who are women divided by the total number of active borrowers.
- *Percent - Rural Borrowers* is the number of active borrowers who are located in rural areas (as defined by the MFI submitting the survey) divided by the total number of active borrowers.
- *Portfolio at Risk - 30 days* is the value of all loans outstanding that have one or more installments of principal past due more than 30 days over the total value of all loans.
- *Borrowers per Employee* is the number of active borrowers over personnel.[16]

[15] The financial incentives are thus meant to capture the incentives which directly affect profit: the number of borrowers who obtain loans and the rate at which they repay. Thus, this requires reaching and retaining borrowers and having borrowers not go into default.

[16] Note that while this variable is used to create the proxy for the amount of performance-based pay, the proxy is based on the correlation between this variable and the average total compensation and does not necessarily mean the firm has a relatively high or low level of borrowers per employee.

3.1.2 Independent Variables.

The most important independent variables are whether or not the organization is a for-profit and the average loan balance as a proxy for the wealth of the borrowers served. In addition, I utilize the types of products and services offered to perform cluster analysis and capture diversification, as discussed in the next section. Finally, I use the number of incentives, described earlier, as a dependent variable in exploring pay-for-performance.

For-Profit Indicator is an indicator variable that captures whether the organization is classified as a for-profit as of its latest filing.

Average Loan Balance per Borrower is the average loan balance for a given borrower in US Dollars. This is a widely used proxy for the wealth of the borrower in the microfinance literature (Cull *et al.,* 2011).

3.1.3 Controls

Gross Loan Portfolio controls for the size of the organization, and thus for scale effects that may affect the compensation or incentive structure. *Borrowers per employee* reflects how much profit or value they are generating, as reaching more borrowers assists in both profit-maximization and borrower outreach. In addition, reaching female or rural customers may be more difficult given that they are less traditional borrowers, and thus I control for *Percent of Loan Portfolio to Rural Borrowers* and *Percent of Loan Portfolio to Female Borrowers.*[17] Finally, I utilize country indicator ("dummy") variables, so my results examine differences within a country.

3.2 Summary Statistics

Table 3.2 contains the data on incentives and compensation, broken out by profit status for the year 2010. This subset of data contains 132 non-profit organizations and 84 for-profit organizations

[17] I consider models with and without these two variables as they are only available for a subsample of firms and thus decrease the sample size.

in Latin America.[18] The T-test column tests whether these means are statistically significantly different, whereas the T-stat column contains the t-statistic from the regression of the variable of interest on the for-profit indicator variable with country controls. In other words, the T-test looks at whether the values differ by profit-status across Latin America whereas the T-stat investigates the difference within a country.[19] For-profit organizations have higher values of all incentives, other than outreach to women and social outreach. However, the only difference that is statistically significant is that for-profit organizations are more likely to provide incentives based on obtaining new borrowers from the target market. I also compare the total number of dimensions incentivized and see that for-profits have a higher, but not statistically significant, value of this variable. Finally, the average total compensation per employee is higher in for-profit organizations and this difference is statistically significant.

INSERT Table 3.2

Table 3.3 contains the data on indicator variables for the credit products offered by the organizations, again broken out by profit status. This table indicates that for-profits are more likely to offer small-medium enterprise loans, and less likely to offer loans for education, when I control for country fixed effects. Table 3.4 then contains comparable data regarding the percentage of the MFI's total loans by product type. While for-profit organizations make (statistically significantly) more corporate loans, otherwise they have a comparable breakdown of loan types.

INSERT Table 3.3

INSERT Table 3.4

There are more significant differences between non-profits and for-profits in the targeting of

[18] Not all firms fill out the incentive portion of the Social Performance Profile which is why this number is less than the 252 firms in the larger sample.

[19] Countries have different proportions of for-profit and non-profit organizations, and thus comparing across countries as opposed to within a country may lead to different levels of statistical significance.

borrowers, as well as in the other products and services that they offer. Table 3.5 presents data on the borrower populations targeted by for-profits as compared to non-profits, and the observed difference in average loan size and the amount of loans made to the rural population and to female borrowers. Non-profits are more likely to indicate that they target the female population, the rural population, and very poor and poor clients, with the difference for female population and poor borrowers being statistically significant. In terms of the actual loans made, non-profits have a statistically significantly higher share of loans made to the rural and female subpopulations, and have a smaller average loan size, further suggesting a focus on the lower income population.

INSERT Table 3.5

In addition to focusing on different populations, non-profits offer different products and services. In particular, for-profit institutions are significantly more likely to offer many financial products, including voluntary and fixed term deposits, checking accounts, and credit or debit cards as seen in Table 3.6. On the other hand, non-profits are significantly more likely to offer related and unrelated educational and other support services as seen in Table 3.7. These include skills and business development, various education services, and services to support females, including legal services for victims of violence.

INSERT Table 3.6

INSERT Table 3.7

Table 3.8 contains summary statistics of the average balance sheet variables to show the differences by profit status, where for-profits are, on average, much larger measured by both financial and organizational size. In addition, for-profits tend to charge higher interest rates and are more profitable. These differences are suggestive of different organizational objectives between for-profit and non-profit institutions.

INSERT Table 3.8

Overall, these summary statistics suggest a few things relevant for this paper. First, there are differences on average between for-profits and non-profits, particularly in terms of the services and products that are offered and the borrowers that are targeted. This suggests that even though for-profits and non-profits co-exist in this industry, they are still diversified and somewhat segmented. Thus, my empirical approach importantly captures this product diversification in order to examine the effect of the product offerings as separate from the effect of profit status. Second, while there are some differences in the dimensions along which employees are incentivized, the average differences in the dimensions considered are largely statistically insignificant. This is somewhat surprising and thus merits further consideration in my analysis below to understand what elements are important in determining these dimensions and also whether they have a differential effect on compensation by profit status.

3.3 Analysis

Because there are a large number of products and services, I use cluster analysis to understand the relationships between these products and services and to examine whether there are observable patterns in offerings, as well as to classify the organizations based on the sets of products and services they offer (or do not offer). The idea of this approach is that it is a solution to the issue of the high collinearity between the products and services offered. For instance, not surprisingly, there is a high (and statistically significant at the 1% level) correlation of 0.60 between offering women's leadership training and supporting women's rights awareness. However, there is also a very high and significant correlation between women's rights awareness and education on nutrition and health. Thus, rather than regressing on each individual indicator variable, the cluster analysis allows me to group firms based on the sets of products and services they offer, while also providing insight into their clustering behavior.[20]

When I perform clustering with *kmeans* on the products and services described in Tables 3.6 and 3.7 to partition firms into three non-overlapping groups, I get a breakdown of product and

[20] This approach has been used widely in the strategic groups literature and Harrigan (1985) provides a summary and example of how clustering can be used to understand the behavior of firms in an industry.

service types as seen in Table 3.9. The groups are roughly characterized in the following way: Cluster 1 has a much higher prevalence of credit cards, more savings products of all types, and more financing of small-medium enterprises and consumption loans. As a result, I call Cluster 1 the Financial Products Cluster. Cluster 3 contains higher values for many of the services, including skills and business development, all types of education services, and all types of women's services. Cluster 3 is deemed the Borrower Services Cluster. Cluster 2 seems to be largely characterized by not having the characteristics of Clusters 1 and 3, and instead makes largely microenterprise loans. Thus, I call Cluster 2 the Focused Microlending Cluster.

INSERT Table 3.9

In terms of profit-status, 45% of Cluster 1 firms are for-profits, 47% of Cluster 2, and 7% of Cluster 3.[21] Cluster 2 also contains a higher percentage of firms which are classified as "New" or "Young" with 26% as opposed to 12% and 10% for Clusters 1 and 3, respectively. Thus, it seems that Cluster 1 is the more commercial cluster, Cluster 3 is the more socially-oriented cluster, and Cluster 2 contains more transitioning organizations.[22]

If I then repeat the summary statistics by cluster breakdown, I find that Cluster 3 rewards on a larger number of dimensions, consistent with the larger number of services these organizations offer their borrowers. In addition, Cluster 1 pays employees the most, which aligns with the view of this cluster as offering products most similar to a commercial bank. When examining the other summary statistics, I find that the clusters target borrowers in a way that is not surprising based on the different products and services offered. Namely, Cluster 1 targets fewer women and fewer Very Poor or Poor Customers, whereas Cluster 3 targets higher along both of these dimensions. Cluster 1 has a larger average loan balance than Cluster 3, which again supports the use of average loan balance as a proxy for the wealth of the customers served. Cluster 2 seems to focus on the urban poor, based on average loan size and percent of loans made to the rural population. Finally,

[21] Because for-profits account for about 40% of the sample, non-profits are eight times more likely to be in Cluster 3 than for-profits.

[22] This is also reflected by the relatively worse performance of firms in Cluster 2, and merits further investigation.

I also find that Cluster 1 firms tend to be larger and more profitable than either Cluster 2 or 3 firms, which is consistent with theoretical and empirical work that larger loans are more profitable (McIntosh & Wydick, 2005). Thus, I will control for the firm's cluster value in my analysis, so that I can examine the effect of profit-status while controlling for the mix of products and services being offered. This helps narrow down the mechanisms at work, because even within a mixed industry, non-profits and for-profits may offer distinct products and services.

Next, I move onto testing the hypotheses by considering the use of HR systems by profit status and the wealth of borrowers served. Tables 3.10, 3.11, and 3.12 run the same analysis with dependent variables of average total compensation, the number of dimensions incentivized, or the indicator variable for high value of the pay-for-performance proxy, respectively. The basic empirical model run for the average total compensation of firm j in country c is then:

$$AverageCompensation_{j,c} = \beta_0 + \beta_1 ForProfit_{j,c} + \beta_2 LoanBalance_{j,c} + \beta_3 LoanBalance_j * ForProfit_{j,c}$$

$$+(\beta_4 - \beta_6)Z_{j,c} + (\beta_7 - \beta_{25})Country_c \quad (1)$$

where $Z_{j,c}$ is the set of controls, including the Borrowers per Employee, the Borrowers per Employee interacted with the for-profit indicator variable, and the Gross Loan Portfolio. I run the models with and without controls for the percent of female borrowers and the percent of rural borrowers and the results are consistent across both models. In addition, I run the analysis including controls for cluster and thus the full model for firm j in country c and cluster l is:

$$AverageCompensation_{j,c,l} = \beta_0 + \beta_1 ForProfit_{j,c,l} + \beta_2 LoanBalance_{j,c,l} + \beta_3 LoanBalance_j * ForProfit_{j,c,l}$$

$$+(\beta_4 - \beta_6)Cluster_l + (\beta_7 - \beta_9)Cluster_l * ForProfit_{j,c} + (\beta_{10} - \beta_{12})Z_{j,c} + (\beta_{13} - \beta_{31})Country_c \quad (2)$$

Because I am controlling for both cluster and country in this full model, the identification for the coefficients on the loan balance and for-profit indicator variable comes from differences within

a country and within a given cluster. The models for the number of dimensions and the pay proxy follow the same specification. Ordinary Least Squares (OLS) is used to estimate the first two, whereas a Probit model is used to estimate the pay proxy as the dependent variable is an indicator.

Model 1 of Table 3.10 shows that within a given country, for-profits pay their employees more on average, as I run average total compensation on the for-profit indicator variable and country dummies. This result holds when I add in the controls in Model 2, as specified in Equation 1 above. Thus, I find support for Hypothesis 1 that for-profits pay their employees higher average total compensation.

INSERT Table 3.10

To test Hypotheses 3 and 5, I examine the coefficient of the average loan balance per borrower in Models 2 and 4 of Table 3.10. As mentioned earlier, this variable serves as a good proxy for the average wealth of the borrowers being served. The coefficient on average loan balance per borrower is positive and significant in both of these models, providing support for Hypothesis 3 that employees in firms targeting wealthier borrowers get paid more. To examine Hypothesis 5, I then consider the coefficient on the interaction of average loan size with the for-profit indicator variable. The coefficient is negative and significant and it mostly off-sets the positive and significant coefficient on the non-interacted average loan balance. Thus, for-profits do not lower the average total compensation if they have an increased mission focus on targeting lower income borrowers, supporting Alternative Hypothesis 5.

Models 3 and 4 also control for the different products and services being offered by adding indicator variables for the firm's cluster, as shown in Equation 2 above. Non-profits that are in the Borrower Services Cluster (Cluster 3) are paid less, whereas employees of for-profits in this cluster are paid more, relative to employees in the Financial Products Cluster. However, the positive and significant coefficient on the For-Profit indicator variable remains, although with a lower magnitude, indicating that the higher total compensation of employees in for-profit firms is partly, but not completely, captured by the different sets of products and services offered in for-profits.

Model 4 uses the controls for both the firm characteristics from Model 2 and the clusters from Model 3, and the for-profit indicator variable continues to be statistically significant and positive. Thus, non-profit status, targeting lower income borrowers, and focusing on delivery of services are complementary in their relationship with lower average total compensation for employees.

Table 3.11 follows the same format as Table 3.10, but examines the dependent variable of the number of dimensions along which the firms incentivize employees in order to test Hypothesis 6. Across all four models, the coefficient on the For-Profit indicator variable is not statistically significant. However, Models 2 and 4 show that, among non-profit organizations, higher average loan size is associated with a fewer number of dimensions being incentivized, but this effect does not hold for for-profit organizations in Model 4. This suggests that the issue with using pay-for-performance among non-profits is not that it is difficult to find metrics to incentivize when focusing more on mission, as firms that make loans to a relatively lower income population actually use more dimensions to incentivize employees. Thus, I find support for the first specification of Hypothesis 6 in non-profit organizations, but not in for-profit organizations.

INSERT Table 3.11

Table 3.12 follows the same format as the preceding tables but uses as the dependent variable the indicator variable for a high level of pay-for-performance, as created by the proxy described earlier, and performs a Probit analysis. Across all four models, the coefficient on the For-Profit indicator variable is positive, but only statistically significant in Model 1. Thus, I find mild support for H2 that for-profit organizations utilize a higher level of pay-for-performance. In addition, across all organizations, high average loan size is associated with an increased likelihood of having a high value of the pay-for-performance indicator variable. Thus, I find support for H4 that organizations targeting wealthier borrowers utilize higher levels of pay-for-performance. However, I do not find support for Alternative H5 that this effect is weaker in for-profit organizations, as the coefficient of the interaction of loan size with profit status is positive and insignificant.

INSERT Table 3.12

4 Discussion

Before concluding, I consider some limitations and ideas for future research. An alternative explanation for the different pay in non-profits is that non-profit employees are simply less skilled, and thus they are being paid less because their work is less valuable. However, given that I control for the number of borrowers per employee and the size of the loan, which could be thought of as performance metrics for the employees, this seems less plausible. In addition, the results are robust to controlling for the yield, as obtaining higher yield is another way that differences in skill could manifest themselves. Another alternative explanation is that for-profits hire more administrative personnel, as opposed to loan officers, and that the former get paid more. This is possible, but given that for-profits have, if anything, lower administrative expenses as a ratio of assets as seen in Table 3.8, this explanation is unlikely.

While causal analysis of the effectiveness of HR systems requires variation at the firm-level over time in terms of the HR processes that are utilized, I begin to explore whether incentives and pay-for-performance interact differently across profit status in Table 3.13. This table looks at five performance variables and the related incentives, as well as the incentive interacted with the indicator variable for a high level of pay-for-performance. In particular, Models 1 through 5 consider the dependent firm performance metrics of borrower retention rate, the percent of female borrowers, the percent of rural borrowers, the ratio of portfolio at risk of default within 30 days, and the borrowers per employee and analyze the effects of a corresponding employee (financial) incentive.[23] Thus, the model I run for borrower retention, for instance, for firm j in country c is:

$$BorrowerRetention_{j,c} = \beta_0 + \beta_1 ForProfit_{j,c} + \beta_2 HighProxy_{j,c} + \beta_3 HighProxy * ForProfit_{j,c} \quad (3)$$

$$+ \beta_4 RetentionIncentive_{j,c} + \beta_5 RetentionIncentive * ForProfit_{j,c}$$

$$+ \beta_6 RetentionIncentive * HighProxy_{j,c} + \beta_7 RetentionIncentive * ForProfit * HighProxy_{j,c}$$

[23] The corresponding employee incentives for these performance measures are: borrower retention, female outreach, rural outreach, portfolio quality, and acquiring new borrowers, respectively.

$$+(\beta_8 - \beta_{26})Country_c$$

Model 1 in Table 3.13 shows that having an incentive for borrower retention is associated with higher borrower retention for for-profits, but lower borrower retention for non-profits unless the firm also has a high level of pay-for-performance. Model 2 shows a different result for the percent of female borrowers, where an employee incentive is associated with a higher percentage of female borrowers for non-profits, but only associated with a higher percent in for-profits if the organization does *not* utilize high pay-for-performance. These two results together suggest that for a social-mission oriented dimension, namely the percent of female borrowers, the steepness of incentives might detract from for-profits' ability to effectively pursue this social goal. On the other hand, steep pay-for-performance seems useful for non-profits in pursuing more financial goals, since the borrower retention incentive is only associated with higher borrower retention when the non-profit also has a high value of the pay-for-performance indicator variable. This suggests that perhaps the dimensions of incentives and the level of pay-for-performance interact to help non-profits pursue financial goals but detract from for-profits effort to pursue social goals. Examining different dimensions of performance, both financial and social, and how they interact with both the existence and steepness of rewards is an important avenue of future research to try to better understand the contingencies and mechanisms that determine the use and effectiveness of HR systems for different profit statuses and other firm characteristics.

INSERT Table 3.13

In addition to the limitation posed by the cross-sectional nature of the incentive data, the setting of microfinance may limit generalizability. On one hand, because a vast majority of firms use some type of incentives,[24] it means that there is sufficient variation to explore the effects of different types and levels of incentives. However, to the extent that this high usage of performance-based pay is unusual, especially in non-profits, the results might be less generalizable. This high usage of incentives may come from the hybrid nature of the industry, where there is a long history of commercial banking where employee incentives are common and the data to use for performance

[24] 84% of non-profits and 91% of for-profits identify at least one incentive dimension utilized for their employees.

metrics is widely available. To the extent that in other mixed industries it is more difficult to come up with metrics for performance-based pay for social goals, I expect the differences between for-profits and non-profits to be greater, as non-profits will be less able to explicitly reward social objective achievements. In other words, I expect my estimates to be conservative regarding the differences between HR systems employed by for-profits and non-profits in other mixed industries.

5 Conclusion

The results in Tables 3.10 through 3.12 suggest that the level and bonus structure of pay and the number of dimensions being incentivized have different relationships depending on the type of borrower being targeted. The results seemingly contradict the idea that more mission-oriented firms have a harder time using incentive pay, but are not surprising given that my clustering analysis shows that the mission-oriented firms also offer more services. In other words, because these firms value more services being provided, they are more likely to use multiple incentives. In many ways, incentive pay may be more productive in these more socially-oriented firms to clarify the expectations and desires for employee behavior, whereas this type of clarification may not be necessary in a firm with a simpler objective function.

Using weaker incentives per dimension, but the same amount of total performance-based pay, would be consistent with a model based purely on agency theory, like the multitask model in Holmstrom and Milgrom (1991). However, the lower variance of average total compensation in non-profits suggests that non-profits use weaker incentives overall. Thus, I suggest that non-profits are not just incentivizing more effort along a higher number of dimensions, but are instead using incentives to signal where intrinsically motivated employees should focus their efforts. While this signal might be achievable simply though the mission statement of the organization, explicitly tying at least some level of employee pay to the information adds credibility to the signal. In addition, as non-profits experiment with offering new products and services in an increasingly competitive environment, employee incentives are perhaps easier to alter than the overall firm mission. In particular, as relational contracts are difficult to build and to change (Gibbons & Henderson, 2012), it is important to understand if weak performance incentives can be used to signal the multidimen-

sional and imprecisely delineated organizational goals of such non-profits.

This research importantly addresses a key issue in the prior literature. While there is substantial existing work that argues for the importance of the fit between strategy and human resource systems (Delery & Shaw, 2001), in practice, determining fit has generally focused on differences in such aspects as "training, sophisticated selection, financial incentives, and other practices" (Shaw *et al.,* 2013). In this paper, I use profit status and the products and services offered by the firm to address the call for "more theoretical work on the 'black box' between the HR architecture and firm performance" (Becker & Huselid, 2006). While my finding of distinct incentives in non-profits does not necessarily rebut the prior literature, it does suggest that the conflicting findings in prior research may reflect the difficulty in capturing what constitutes a high performance system. In particular, in non-profits, a lower compensation, reflecting the hiring and retention of employees motivated by the organization's mission, may actually be a "high investment" human resource practice. The cost here is not in the level of the compensation but rather in maintaining the firm's mission and its alignment with employees' social goals and avoiding the pull of products and practices which would violate this relational contract. Thus, employee incentives are used as signals to help guide the relational contract, rather than to provide extrinsic motivation for employee effort.

One way to view the role of human resource systems is that HR systems can be used to help implement a firm's strategy (Becker & Huselid, 2006). Using a self-reported survey is actually an advantage in this regard as I can see what products and services the organization intends to offer, the HR incentives used by the organization, and the actual composition of the products and services. In future work, considering how HR incentives may interact with the intended products to predict the actual composition of products could help to further the understanding of the contingencies under which HR systems can be used to implement strategy. In addition, this positioning of the HR system as a means to implement a strategy helps to address concerns in the literature regarding the omission of implementation from the resource-based view (Barney, 2001; Priem & Butler, 2001).

By looking at the use of performance incentives in both for-profit and non-profit firms of varying levels of social mission as captured by the products and services offered and the borrowers targeted,

I respond to the call in Coff and Kryscynski (2011) to separate out bundles of practices that create a competitive advantage. Specifically, I have firms in each of the possible combinations of profit status, mission orientation, and employee incentives. By looking at the variety of products and services used and offered in non-profit organizations as compared to for-profit organizations, this paper suggests that the findings comparing non-profit and for-profit organizations are comparable to the research regarding the use of incentives in innovation examined in Ederer and Manso (2013). In other words, the prior literature recognizes that non-profit employees differ in their commitment to the mission and thus a proportion of their utility is derived from providing the services rather than simply from their compensation. In addition, the prior literature observes that non-profits have different objective functions and thus employee incentives need to reflect these different objectives. However, it might also be that non-profits are in fact more innovative and creative, and that the use of strong financial incentives may undermine such creativity. Thus, while non-profits offering different products and services within the same industry as for-profits is certainly not a new idea (e.g. Duggan, 2000), examining the interaction of profit status, employee incentives, and products and services is a fruitful area for future research.

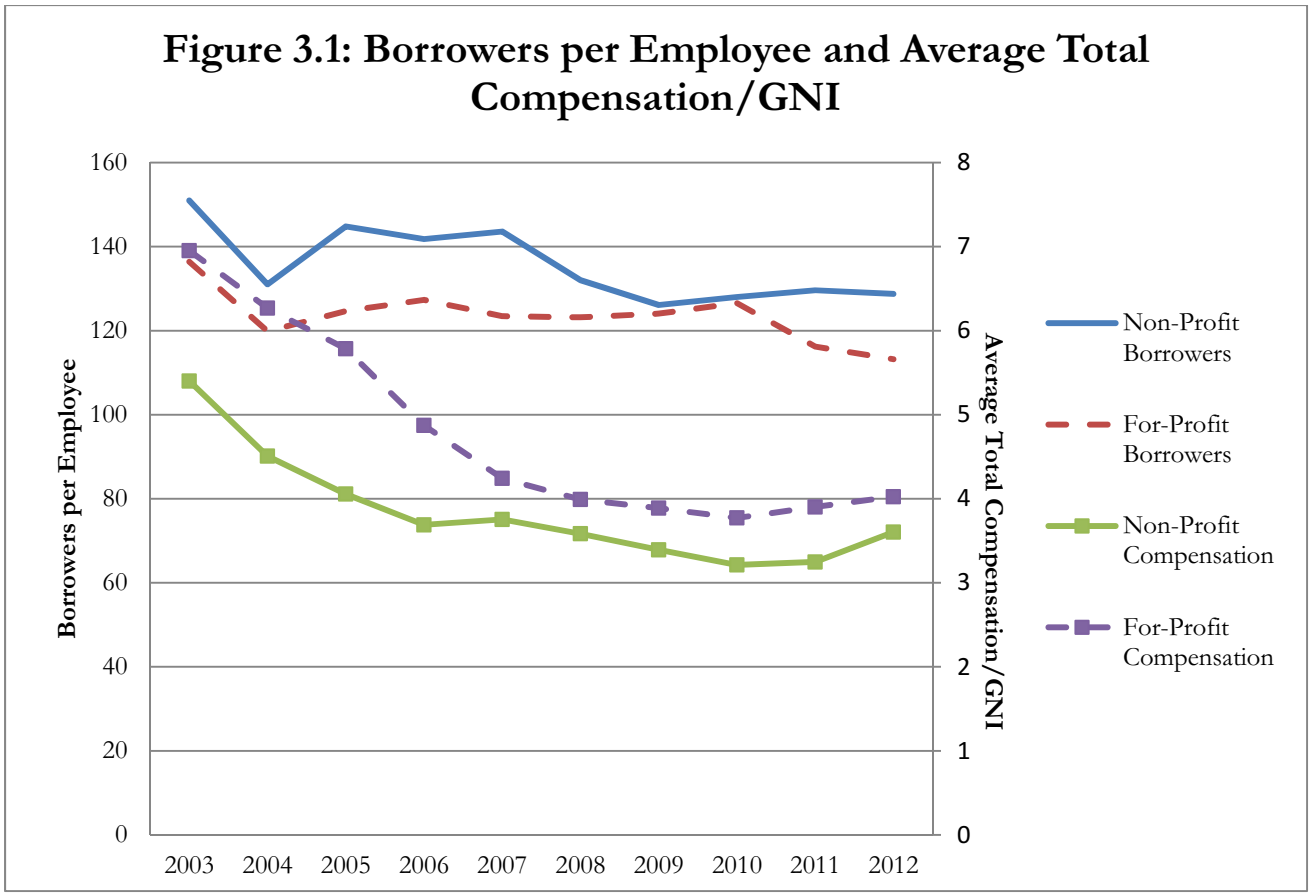
Figure 3.1: Borrowers per Employee and Average Total Compensation/GNI
Borrowers per Employee
Average Total Compensation/GNI
160
140
120
100
80
60
40
20
0
8
7
6
5
4
3
2
1
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Non-Profit Borrowers
For-Profit Borrowers
Non-Profit Compensation
For-Profit Compensation

Table 3.1a: Two High-Correlation Firms

Year	*Number of Borrowers*	*Borrowers per Employee*	*Personnel*	*Total Compensation/GNI*
2003	14,519	108	134	20.07
2004	22,130	91	244	16.14
2005	29,561	79	372	12.48
2006	38,044	81	471	12.8
2007	39,329	68	575	12.62
2008	35,423	58	616	9.72

Year	*Number of Borrowers*	*Borrowers per Employee*	*Personnel*	*Total Compensation/GNI*
2006	3,257	93	35	2.52
2007	3,122	87	36	2.34
2008	2,875	90	32	2.55
2009	2,159	80	27	2.23
2010	1,603	50	32	2.21
2012	871	41	21	1.69

Table 3.1b: Two Low-Correlation Firms

Year	*Number of Borrowers*	*Borrowers per Employee*	*Personnel*	*Total Compensation/GNI*
2006	10,909	303	36	4.55
2007	13,128	313	42	4.78
2008	14,146	289	49	4.84
2009	12,079	252	48	5.06
2010	13,015	303	43	4.83
2011	11,133	247	45	5.16
2012	8,509	167	51	4.48

Year	*Number of Borrowers*	*Borrowers per Employee*	*Personnel*	*Total Compensation/GNI*
2004	3,893	75	52	11.63
2005	5,968	80	75	9.01
2006	9,219	90	103	8.35
2007	12,921	96	135	8.16
2008	17,970	99	181	7.72
2009	14,166	84	168	7.39
2010	10,349	67	155	6.86
2011	8,097	70	116	5.23
2012	4,924	54	91	5.6

Table 3.2: Use of Incentives

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Incentive Dimensions				
Portfolio Quality	0.97	0.98	0.28	1.21
Borrower Retention	0.50	0.60	1.37	1.26
Women Outreach	0.17	0.11	1.21	0.69
New Borrowers	0.75	0.94	3.68***	2.90***
Rural Outreach	0.14	0.21	1.5	1.45
Quality of Client Interaction	0.18	0.21	0.59	0.07
Social Outreach	0.13	0.08	1.03	1.24
Number of Incentives	2.83	3.13	1.54	1.28
Total Compensation/GNI	2.96	3.59	2.06**	1.15***
Observations	132	84		

Table 3.3: Credit Products Offered

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Credit Product Type				
Small-Medium Enterprise	0.33	0.42	1.47	1.95*
Agricultural	0.57	0.44	1.93*	0.12
Household Finance	0.61	0.57	0.62	1.01
Consumer Finance	0.55	0.56	0.18	1.35
Education	0.33	0.18	2.50**	1.99**
Microenterprise	0.99	0.95	1.93*	1.2
Number of Credit Products	3.36	3.12	1.21	0.69
Observations	159	93		

Table 3.4: Credit Product Breakdown

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Credit Product Type (%)				
Microenterprise	0.28	0.27	1.16	1.02
Household Finance	0.05	0.05	0.79	0.5
Consumer Finance	0.03	0.03	1	0.2
Education	0.00	0.00	0.86	0.38
Corporate Loan	0.01	0.02	2.16**	2.90***
Observations	138	85		

Table 3.5: Borrower Targets and Amounts

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Subgroup Targeted				
Women	0.43	0.26	2.83***	3.98***
Rural Population	0.35	0.29	0.91	0.15
Poverty Target				
Very Poor	0.27	0.20	1.2	0.13
Poor	0.70	0.53	2.66***	1.17
Avg. Loan Balance/GNI	0.34	0.42	1.48	3.21***
% of Loans to Rural Pop.	0.42	0.30	2.26**	1.66*
% of Loans to Females	0.59	0.54	1.85*	1.99**
Observations	159	93		

Table 3.6: Other Products Offered

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Savings Product Type				
Compulsory Deposits	0.16	0.09	1.74*	1.22
Voluntary Deposits	0.08	0.17	2.47**	3.12***
Fixed Term Deposits	0.25	0.33	1.51	3.13***
Checking Account	0.04	0.15	2.99***	2.39**
Finance Product Type				
Credit/Debit Card	0.14	0.27	2.59**	4.46***
Mobile Payment	0.01	0.01	0.13	0.15
Remittance Services	0.18	0.17	0.08	0.43
Observations	159	93		

Table 3.7: Other Services Offered

Variable	*Non-Profit*	*For-Profit*	*T-test*	*T-stat*
Enterprise Services	0.40	0.17	3.79***	3.24***
Skills Development	0.28	0.15	2.41**	1.79*
Business Development	0.28	0.10	3.55***	3.06***
Education Services	0.55	0.34	3.17***	2.61**
Financial Literacy	0.47	0.33	2.14**	1.99**
Children and Youth	0.07	0.03	1.23	0.93
Health Nutrition	0.21	0.05	3.46***	3.58***
Occupational Safety	0.07	0.03	1.23	1.66*
Women's Services	0.47	0.17	4.89***	5.13***
Leadership Training	0.43	0.12	5.37***	5.29***
Rights Education	0.30	0.06	4.50***	4.08***
Legal Services for Violence Victims	0.08	0.04	1.02	0.33
Environmental Services	0.52	0.43	1.41	0.26
Raise Awareness	0.38	0.29	1.4	0.87
Identify Enterprises with Env. Risk	0.04	0.08	1.04	1.71*
Lending Linked to Env. Friendly Products	0.03	0.01	0.79	0.43
Lending Linked to Alternate Energy	0.01	0.05	1.93*	1.99**
Train Clients	0.06	0.00	2.49**	1.94*
Health Services	0.21	0.10	2.29**	1.37
Observations	159	93		

Table 3.8: Balance Sheet Variables by Profit Status

Variable	*Non-Profit*	*For-Profit*
Size Variables		
Assets (Millions of USD)	33.00	178.00
Gross Loan Portfolio (Millions of USD)	25.90	140.00
Deposits (Millions of USD)	15.80	84.20
Number of Offices	11.87	46.43
Personnel	144.31	768.45
Number of Active Borrowers (Thousands)	18.50	112.36
Performance Variables		
Debt/Equity Ratio	3.54	5.79
Return on Assets	-0.01	0.02
Yield on Gross Portfolio	0.27	0.40
Operating Expenses/Assets	0.21	0.24
Cost per Borrower	210.66	275.48
Borrowers per Employee	121.40	133.42
Portfolio at Risk - 30 Days	0.08	0.06
Administrative Expenses/Assets	0.09	0.10
Profit Margin	-0.06	0.04
Observations	158	92

Table 3.9: Products and Services by Cluster

Variable	*Cluster 1*	*Cluster 2*	*Cluster 3*
Credit Product Type			
Small-Medium Enterprise	0.55	0.11	0.41
Agricultural	0.69	0.22	0.70
Household Finance	0.83	0.21	0.79
Consumer Finance	0.90	0.16	0.54
Education	0.31	0.07	0.54
Microenterprise	0.97	0.97	0.98
Savings Product Type			
Compulsory Deposits	0.21	0.05	0.13
Voluntary Deposits	0.22	0.03	0.04
Fixed Term Deposits	0.55	0.05	0.13
Checking Account	0.15	0.02	0.05
Finance Product Type			
Credit/Debit Card	0.32	0.08	0.11
Mobile Payment	0.01	0.00	0.04
Enterprise Services			
Skills Development	0.09	0.21	0.55
Business Development	0.10	0.13	0.55
Education Services			
Financial Literacy	0.26	0.36	0.82
Children and Youth	0.04	0.02	0.14
Health Nutrition	0.01	0.15	0.43
Occupational Safety	0.00	0.04	0.18
Women's Services			
Leadership Training	0.11	0.20	0.88
Rights Education	0.06	0.10	0.68
Legal Services for Violence Victims	0.00	0.05	0.20
Environmental Services			
Raise Awareness	0.31	0.21	0.63
Identify Enterprises with Env. Risk	0.05	0.10	0.00
Lending Linked to Env. Friendly Products	0.04	0.01	0.00
Lending Linked to Alternate Energy	0.06	0.01	0.00
Train Clients	0.01	0.03	0.11
Observations	105	91	56

Table 3.10: Average Total Compensation/GNI by Profit Status, Cluster

	Model 1	*Model 2*	*Model 3*	*Model 4*
For-Profit	1.15***	1.65***	0.87***	1.51***
	(0.17)	(0.32)	(0.21)	(0.35)
Average Loan Balance per Borrower (Thousands of USDs)		0.39***		0.37***
		(0.09)		(0.09)
Average Loan Balance*For-Profit		-0.30***		-0.26**
		(0.10)		(0.11)
Borrowers per Employee (Hundreds)		0.29**		0.28**
		(0.13)		(0.13)
Borrowers per Employee*For-Profit		-0.28*		-0.27
		(0.17)		(0.17)
Gross Loan Portfolio (Billions of USDs)		0.47		0.11
		(0.33)		(0.34)
3rd Cluster Indicator			-0.52***	-0.22
			(0.20)	(0.22)
2nd Cluster Indicator			-0.25	0.05
			(0.21)	(0.22)
3rd Cluster Indicator*For-Profit			2.17***	1.83***
			(0.54)	(0.55)
2nd Cluster Indicator*For-Profit			-0.07	-0.23
			(0.33)	(0.34)
Constant	0.90***	0.44	1.22***	0.51
	(0.34)	(0.35)	(0.36)	(0.40)
Observations	228	228	228	228
R-squared	0.812	0.835	0.83	0.846
Country Indicators	Yes	Yes	Yes	Yes

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 3.11: Number of Incentives by Loan Size, Profit Status

	Model 1	*Model 2*	*Model 3*	*Model 4*
For-Profit	0.28	0.29	0.32	-0.15
	(0.22)	(0.60)	(0.31)	(0.68)
Average Loan Balance per Borrower (Thousands of USDs)		-0.46**		-0.41**
		(0.19)		(0.19)
Average Loan Balance*For-Profit		0.35		0.57*
		(0.26)		(0.29)
Borrowers per Employee (Hundreds)		-0.04		-0.06
		(0.22)		(0.22)
Borrowers per Employee*For-Profit		-0.18		-0.01
		(0.31)		(0.31)
Gross Loan Portfolio (Billions of USDs)		0.57		-0.99
		(0.95)		(1.13)
Rural % of Borrowers		0.22		0.1
		(0.47)		(0.47)
Female % of Borrowers		-0.92		-0.87
		(0.81)		(0.82)
3rd Cluster Indicator			0.44	0.38
			(0.31)	(0.38)
2nd Cluster Indicator			0.01	-0.12
			(0.31)	(0.38)
3rd Cluster Indicator*For-Profit			0.88	1.70*
			(0.74)	(0.93)
2nd Cluster Indicator*For-Profit			0.07	0.09
			(0.45)	(0.61)
Constant	3.52***	4.46***	3.41***	4.37***
	(0.56)	(0.99)	(0.61)	(0.99)
Observations	216	146	216	146
R-squared	0.128	0.277	0.156	0.328
Country Indicators	Yes	Yes	Yes	Yes

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 3.12: High Pay-for-Performance by Loan Size, Profit Status

	Model 1	*Model 2*	*Model 3*	*Model 4*
For-Profit	0.35*	0.08	0.32	0.09
	(0.20)	(0.33)	(0.27)	(0.45)
Average Loan Balance per Borrower (Thousands of USDs)		0.25**		0.27**
		(0.11)		(0.13)
Average Loan Balance*For-Profit		0.08		0.05
		(0.19)		(0.21)
Gross Loan Portfolio (Billions of USDs)		-0.03		1.79
		(0.55)		(1.18)
3rd Cluster Indicator			-0.21	0.16
			(0.27)	(0.30)
2nd Cluster Indicator			-0.02	0.36
			(0.27)	(0.31)
3rd Cluster Indicator*For-Profit			0.00	0.00
			(0.00)	(0.00)
2nd Cluster Indicator*For-Profit			0.02	-0.07
			(0.41)	(0.45)
Constant	0.85*	0.73*	0.88*	0.46
	(0.43)	(0.44)	(0.48)	(0.53)
Observations	242	240	239	237
Pseudo R-squared	0.070	0.103	0.075	0.119
Country Indicators	Yes	Yes	Yes	Yes

Standard errors in parentheses
** p<.1, ** p<.05, *** p<.01*

Table 3.13: Performance Effects of High Correlation and Incentives

	Model 1 Borrower Retention	*Model 2* % Female Borrowers	*Model 3* % Rural Borrowers	*Model 4* Portfolio at Risk - 30 days	*Model 5* Borrowers per Employee
For-Profit	-0.07	-0.03	-0.18**	-0.16**	-70.95
	(0.05)	(0.05)	(0.08)	(0.08)	(57.02)
High Correlation Indicator	-0.04	0	-0.15**	0.18**	-49.73
	(0.04)	(0.04)	(0.06)	(0.08)	(32.45)
High Correlation*For-Profit	0.07	-0.05	0.13	0.01	117.62
	(0.07)	(0.07)	(0.11)	(0.02)	(91.11)
Incentive	-0.07*	0.11*	-0.02	0.01	-6.46
	(0.04)	(0.06)	-0.11	(0.05)	(24.49)
Incentive*For-Profit	0.17**	0.36*	0.16	0.14*	105.97*
	(0.07)	(0.20)	-0.19	(0.08)	(58.66)
Incentive*High Correlation	0.10*	0.02	0.19	-0.17**	25.51
	(0.06)	(0.12)	(0.18)	(0.08)	(36.88)
Incentive*High Correlation*For-Profit	-0.14	-0.44*	-0.05	0.00	-139.66
	(0.10)	(0.24)	(0.28)	(0.00)	(95.96)
Constant	0.77***	0.68***	0.17	0.05	89.45**
	(0.07)	(0.08)	(0.15)	(0.06)	(41.76)
Observations	132	165	158	208	213
R-squared	0.118	0.2	0.316	0.424	0.155
Country Indicators	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

** p<.1, ** p<.05, *** p<.01*

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